

THE IRON AGE

Established 1855

New York, September 19, 1912

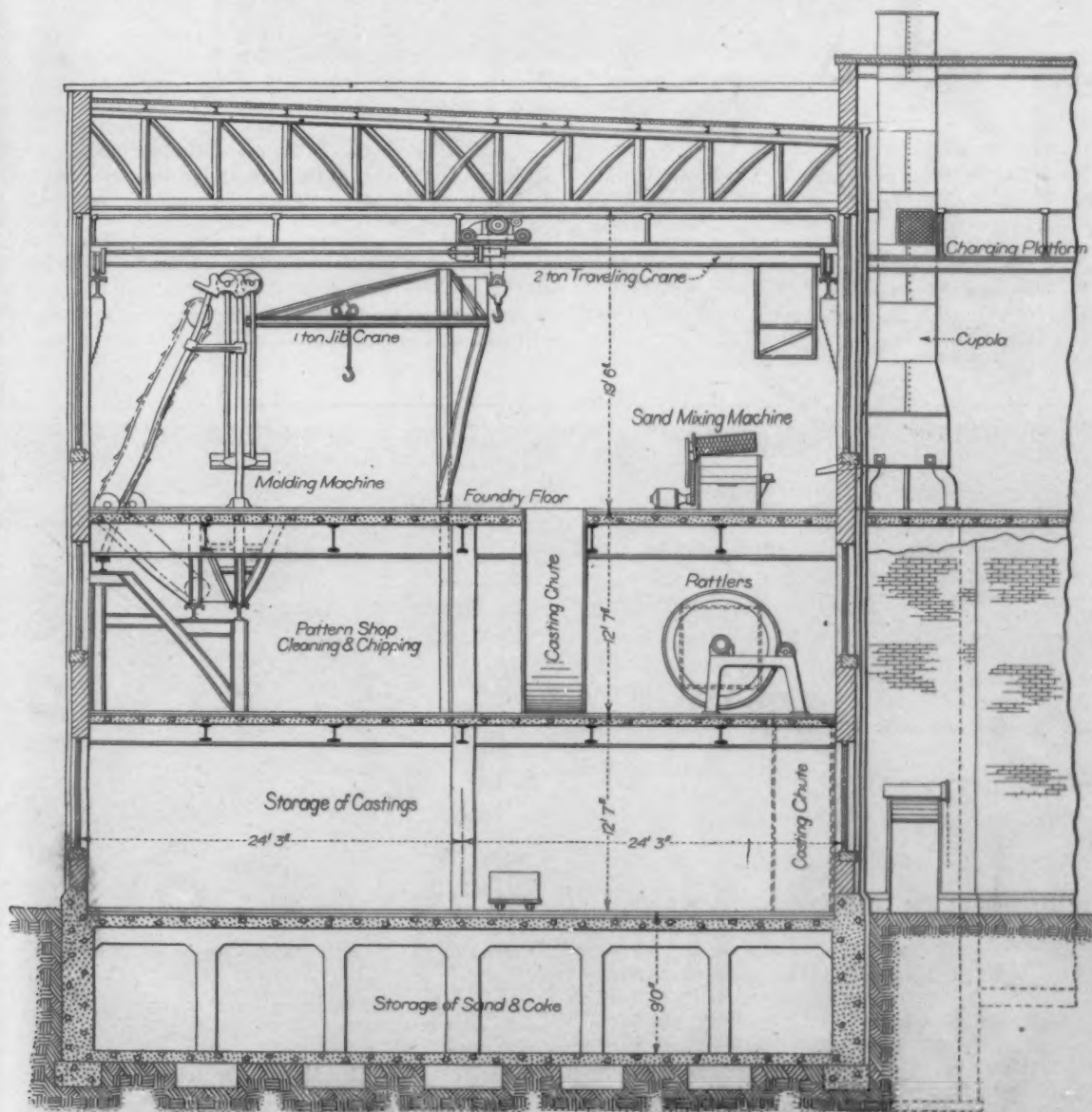
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A Foundry Four Stories in Hight

A Noteworthy Cleveland Plant—Molding and Casting on the Top Floor—Interesting Molding Machines and Apparatus for Handling Sand and Castings

When the Chandler & Price Company, Cleveland, Ohio, maker of printing presses, decided to build a new foundry in order to make its own castings it was forced to meet the problem of erecting a foundry on a somewhat limited site or to select some other location not adjoining its existing plant. The company's machine shops were hemmed in on one side by railroad tracks and on the other sides

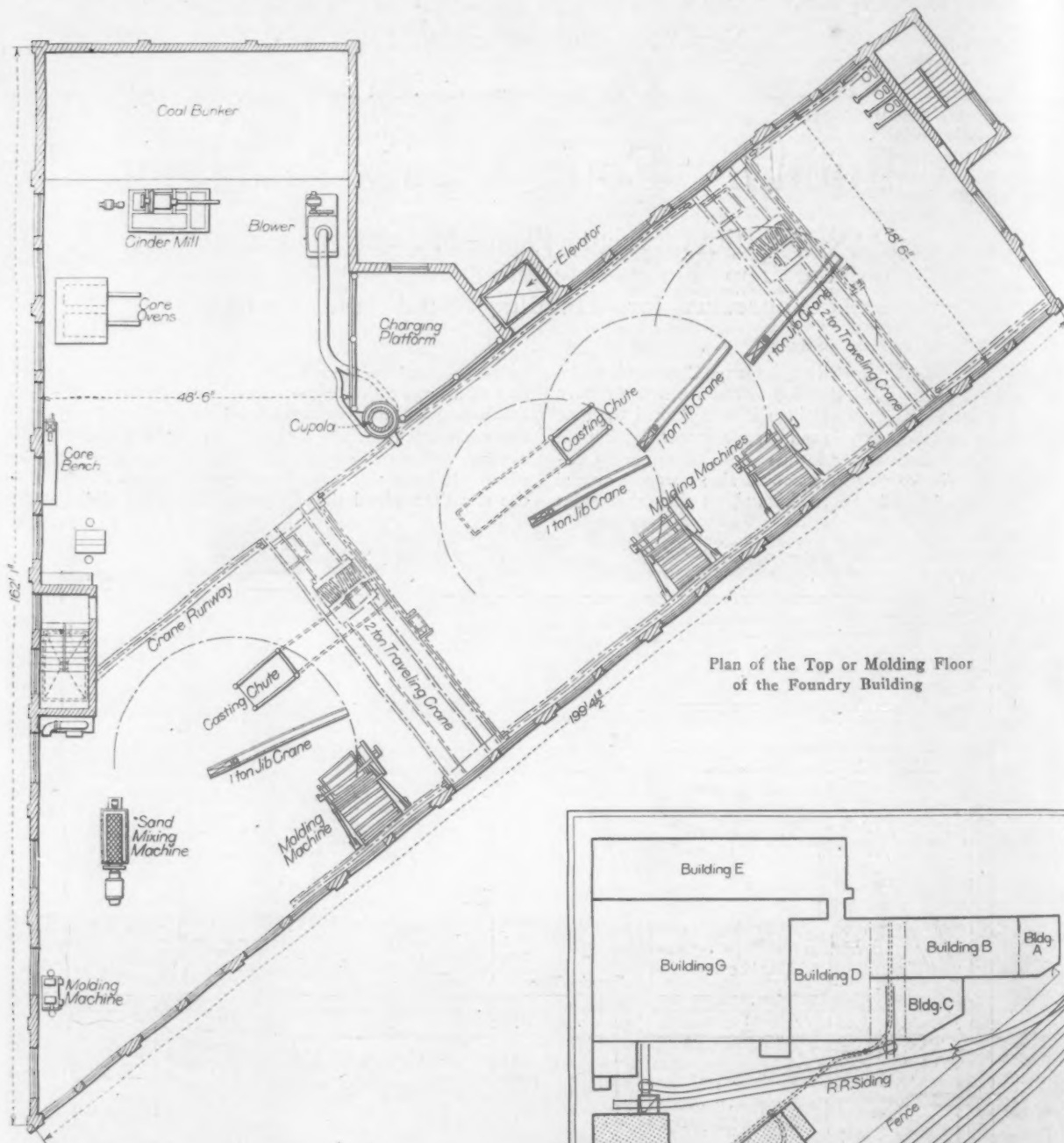
by streets and manufacturing plants, so that the acquisition of a large adjoining site was impracticable. What was available was an irregular-shaped strip of land adjoining the main tracks of the Pennsylvania Railroad and Cedar avenue, and to the east and south of the then existing plant. It became a case in which the size and shape of the site determined the design of the new building. Ac-



Vertical Section through the Four Different Levels of the Foundry of the Chandler & Price Company, Cleveland.

cordingly the company decided to build a three-story and basement foundry building with the melting, molding and core-making rooms on the top floor. The site limitations also resulted in the carrying out of some other interesting features of construction in this plant, which has recently been completed. The cleaning department and pattern shop are located on the second floor, the first floor is used

brick curtain walls. The foundry floor has a 23-ft. ceiling. Its height allows for natural illumination, ventilation and freedom from smoke. The first and second floors have 12-ft. ceilings. The second and third story floors are of reinforced concrete slabs and the first and basement floors are of reinforced concrete. The first or storage floor is built to stand a weight of 1000 lb. per

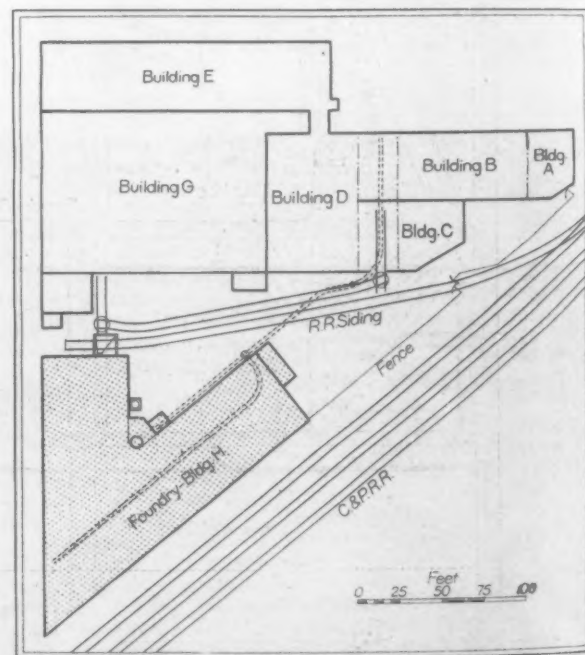


for the storage of castings and the basement for the storage of sand and coke and for pattern storage purposes. Thus the entire plant, including storage room, apart from pig iron storage, is housed under one roof. The product is miscellaneous gray iron machinery castings, from small bench work up to castings weighing 600 lb.

Layout and Construction

The contour of the site necessitated the erection of an irregularly shaped building. This includes a main building 200 x 48 ft. and a wing 100 x 48 ft. An upper floor of the wing is occupied by the core room and the lower part by a power plant which was built to furnish power, light and heat both for the foundry and for the printing press manufacturing department. The location of a power plant directly under the cupola and core room is one of the interesting features of the plant. The building occupies the entire site except a small space left for pig-iron storage and a railroad siding and provides an aggregate floor space of 43,000 sq. ft.

The foundry building is of steel construction with



General Plan of the Main Buildings of the Chandler & Price Plant

sq. ft. The building has a flat steel trussed roof covered with concrete slabs. All of the windows are fitted with steel sash.

The Melting Department

The charging floor is located on a platform on the south end of the building over a portion of the core room, the floor being 19 ft. above the foundry floor. The floor itself is of steel plate. Floor space of 240 sq. ft. is pro-

vided or sufficient for material for a day's melt. There is one 42-in. cupola built by Bryam & Co., Detroit, Mich. The height from the sand bottom of the cupola to the charging floor is 14 ft. which provides more than the usual space for iron to become pre-heated before reaching the melting zone. Pig iron charges for the cupola are made in the storage yard on industrial cars with a capacity of 5000 lb., weighed on a track scale and conveyed to the charging floor on a 3-ton Otis electric elevator. Before the cupola is fired a sufficient number of cars loaded with pig iron are taken to the charging floor for the day's heat and enough coke and limestone is brought from the basement in industrial cars and stored on the foundry

floor for a day's heat. The cupola is charged by hand.

The blast for the cupola is furnished by a No. 5 Roots' positive pressure blower made by the P. H. & F. M. Roots Company, Connersville, Ind. The blower is direct connected to a 25-hp., 220-volt Reliance variable speed motor, the motor gear driving through a rawhide pinion. The usual practice is to use a constant speed motor to drive a cupola blower. In this foundry, however, the character of the work makes it practical to pour and



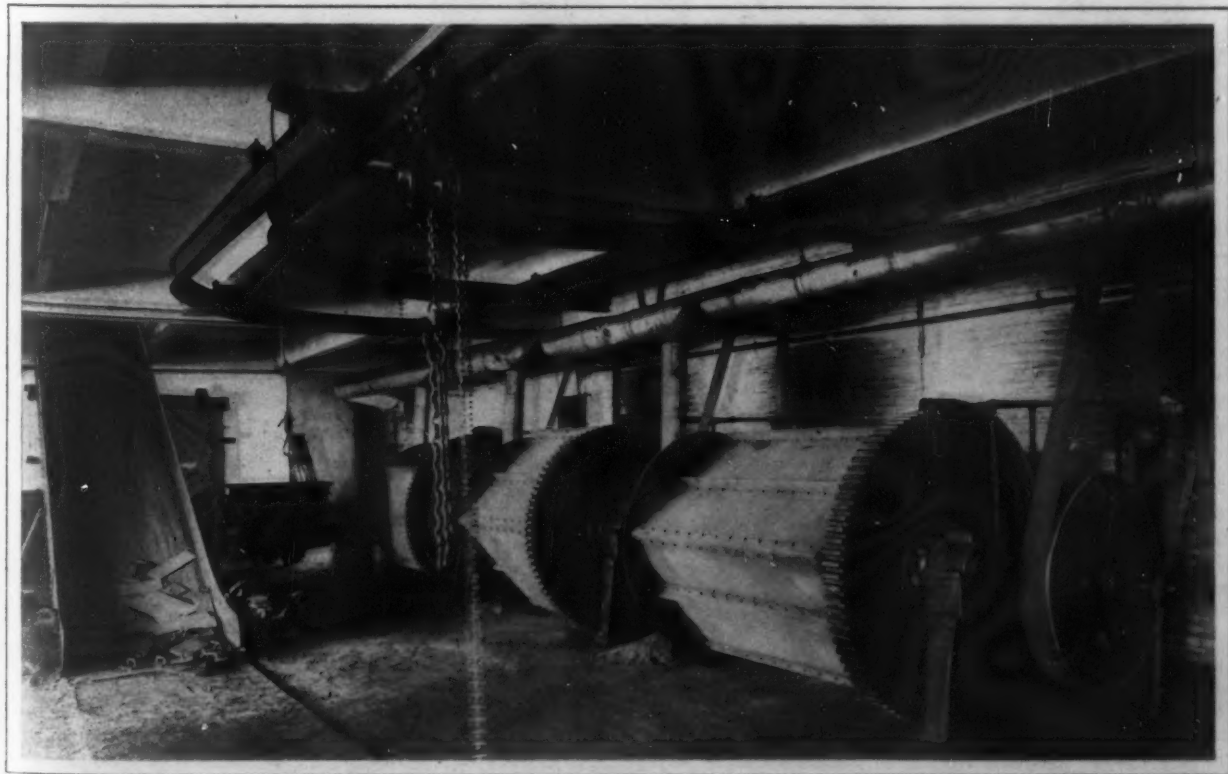
One of the Jib Cranes; Molding Machines in Background; Sand Conveying Bucket in Foreground; Castings Chute at Right

mold at the same time so that to a certain extent there is continuous pouring, and the variable speed motor was adopted with a view to securing a better control of the iron than with a one-speed motor. This motor makes it possible to regulate the blast so as to control the melting rate per hour.

On the foundry floor back of the cupola is a water cinder mill made by the W. W. Sly Mfg. Company, Cleveland. The cupola dump is put through this mill and the iron and coke are reclaimed. The mill is driven by a 10-hp. motor made by the Lincoln Electric Company, Cleveland.

The Molding Facilities

The entire length of the foundry floor is served by two 2-ton electric cranes with a 48-ft. span built by the Euclid Crane & Hoist Company, Euclid, Ohio. Each crane is controlled by an operator stationed in a cage which moves with the crane. Such cage control is, of course, not general except with cranes of larger capacity. On the foundry floor there are also three Euclid jib cranes of a special design which do away with guy ropes, stiff legs or other supports above the floor level. The use of supports which would be in the way



Tumbling Barrels and Monorail System on Cleaning Floor, Showing One of the Casting Chutes at the Left

on the floor is avoided by carrying the main mast to the floor below where its foot is securely anchored. These cranes are 15 ft. 4 in. high, and have booms 17 ft. 9 in. long, so that they serve a 35-ft. diameter circle. Each jib crane is supplied with a 2000-lb. electric hoist. Hot metal from the cupolas is poured into a 2000-lb. geared ladle and is carried by one of the traveling cranes to any point on the molding floor.

All molds are machine made, being formed on three gravity machines built by the A. Buch's Sons Company, Elizabethtown, Pa. These machines are located along the east side of the foundry floor. Two of the machines accommodate 44 x 44-in. flasks and the other takes a flask 44 x 72 in. Sand for molding is shoveled into a riddle just below the floor and from the riddle it drops into a hopper from which it is conveyed by a chain bucket conveyor to the top of the machine 14 ft. above the floor level. From there it is dropped to the flask. While being carried up in the pocket of the conveyor the sand passes under a packer which firmly packs it so that it falls to the flasks in practically solid chunks and is rammed by its own impact. No additional ramming is required.

All patterns for heavier castings are mounted on boards which can be attached to or removed from the gravity molding machines as quickly as they could be

section has four rolling drawers. These ovens are 9 ft. wide, 10 ft. deep and 6 ft. high, inside measure. The core room is also provided with a Wadsworth cylindrical core machine.

On the molding floor there is a sand-mixing machine made by the Standard Sand & Machine Company, Cleveland. This machine, which is direct connected to a 3-hp. Lincoln motor, is used for mixing facing and core sand. It is mounted on rollers so that it can be readily moved from the section of the molding department where facing sand is mixed to the core department.

In the cleaning department on the second floor the cleaning is done with a battery of three rectangular steel exhaust tumbling barrels made by the Cleveland Nickel Works. The sizes of the tumbling barrels are 42 x 36 x 68 in., 42 x 42 x 48 in. and 42 x 42 x 40 in. The exhaust pipe from the barrels leads to a Sly dust arrester which is equipped with a 24-in. American Blower Company fan driven by a 7½-hp. Lincoln motor. The dust hopper is hung at the top of the stairway well, thus economizing space. The discharge of the hopper is through a spout on the landing of the foundry floor where dust is discharged into a hand truck in which it is sent down the elevator to the dump. The cleaning department is equipped with two grinders operated by clutches mounted directly on the line shaft, thus doing away with the counter shaft. The grinders are connected to the main exhaust. One grinder of the Norton Company make is protected by heavy sheet steel guards. Chipping is done with Cleveland Pneumatic Tool Company hammers operated at 80 lb. pressure. In place of hand rubbing a Cleveland portable pneumatic grinder with broad faced wheels is used. Each tumbling barrel is reached by a mono-rail overhead track which connects with other tracks that serve the entire floor. The mono-rail system is provided with a 1-ton hand-chain hoist.

In the pattern room at one end of the cleaning floor are a band saw, circular saw, drill press and two speed lathes all driven by a 10-hp. Lincoln motor. The first or storage floor is equipped with tracks for handling castings on industrial cars after they are sent down in the chutes. The pattern storage vault in the basement is a fireproof room 140 x 16 ft. in size. Injury to patterns from dampness due

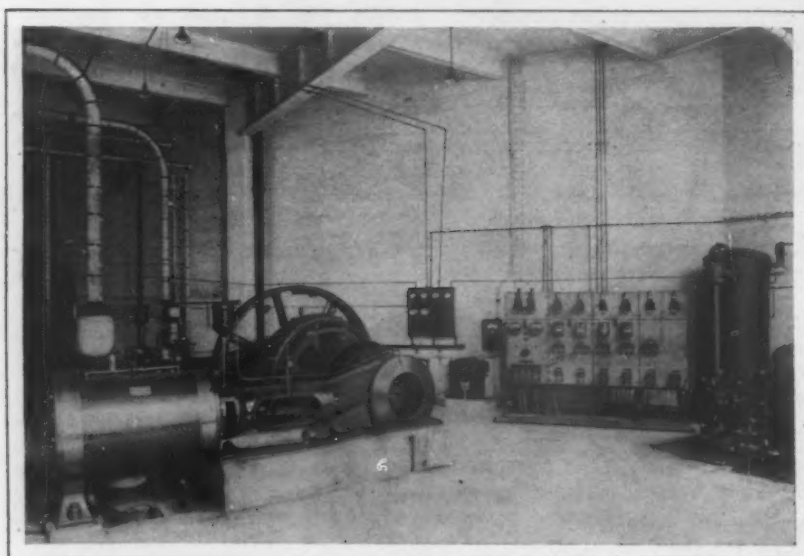
to basement storage is prevented by having the pattern room ventilated by connection with the heating system through which hot air is forced in winter and outside air in summer.

Workmen are safeguarded from injury by various safety devices such as surrounding the molding machines with wooden enclosures and frames of gas pipe around the motors.

The Power Plant

The power plant is equipped with a cross-compound Buckeye Engine Company's engine direct-connected to a 250-kw. direct-current General Electric generator operated on a three-wire system, 110 volts being used for the lighting circuit and 220 volts for the power circuit. A four-panel switchboard was installed by the Leonard-Bundy Electric Company, Cleveland. The electric equipment includes a voltmeter, ammeters, wattmeters and I. T. E. circuit breakers. Air supply for operating the chipping hammers is furnished by an Imperial type-10 steam-driven compressor made by the Ingersoll-Rand Company. This compressor has a piston displacement of 372 cu. ft. of free air per minute. The entire plant is protected from fire by a sprinkler system installed by the General Fire Extinguisher Company. This system includes a 16 x 9 x 12-in. Underwriter pump in the engine room with a capacity of 750 gal. per minute and two tanks above the roofs with a total capacity of 52,000 gal.

The boiler-room equipment includes two 250-hp. Babcock & Wilcox water-tube boilers each served by a chain grate stoker. Coal is stored in a 400-ton sheet steel bin



Engine, Air Compressor and Switchboard in the Power Plant

placed on the floor for ordinary core work. These machines are regarded as having the two-fold advantage of being equal to jobbing methods as well as combining the large output possible with molding machines. The flasks are placed on and removed from the machine by the jib cranes. While one crane is removing a mold, another is placing a fresh flask on the machine. For rapping the patterns after molding each machine is equipped with a pneumatic vibrator made by the Berkshire Mfg. Company, Cleveland. Each molding machine is direct connected to a 10-hp. Lincoln motor. The molds after being poured are shaken out over self-dumping contractors' buckets in which the sand is taken back to the sand piles. In the molding room there is also a jar and ram machine furnished by the A. Buch's Sons Company for snap flask work.

Handling and Cleaning Castings

A unique feature of the plant is the method of handling castings. Each of the two upper floors is provided with two chutes 48 in. wide, built of heavy sheet steel. The castings slide down these chutes under the impetus of their own weight, first from the foundry floor to the cleaning floor and then from the latter to the storage floor. The traveling crane takes the castings from the foundry floor to the top of the chutes which start at the floor level.

The core-room equipment on the foundry floor includes a double gas-fired core oven installed by the J. D. Smith Foundry Supply Company, Cleveland. One section of the oven is served with a core car and the other



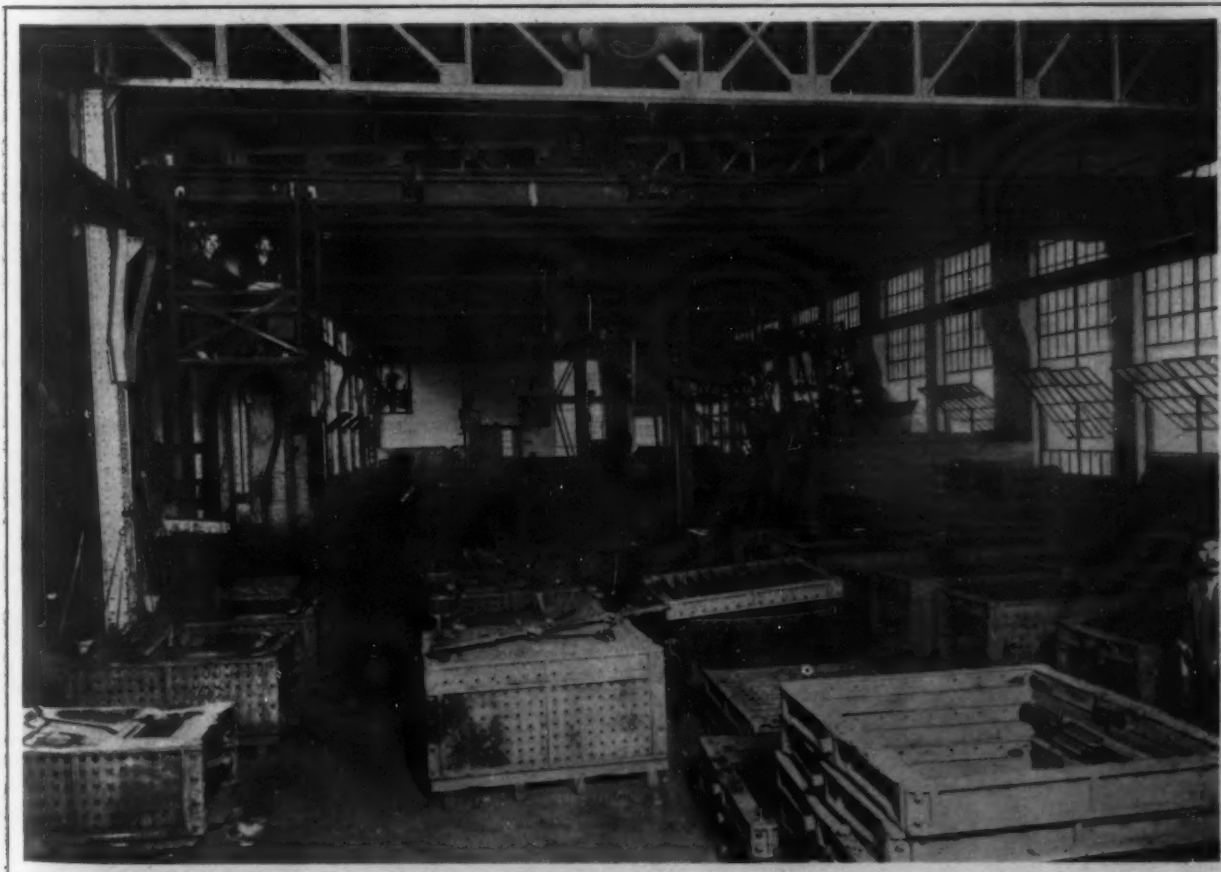
Core Department, Showing Core Oven, Cinder Mill and Cupola Blower

located above the boiler room and is delivered to the boilers by a traveling weighing hopper. Coal is discharged from hopper bottom cars into a chute from where it is taken in a bucket conveyor to the top of the storage bin where it is distributed through the bin by a helical conveyor. The ashes are taken from the basement in the same bucket conveyor and are discharged into a section of the coal storage bin from where they are dis-

charged by gravity into cars. The coal and ash handling equipment was installed by the C. O. Bartlett & Snow Company, Cleveland.

Heating, Ventilation, Lighting and Sanitation

For heating and ventilating the foundry a blower system is used. An American Blower Company No. 9 Sirocco fan with a rated capacity of 170 cu. ft. of air per minute



View from South End of Foundry Floor, Showing Also One of the Heating Pipes Running Through the Roof Trusses

is located in the engine room. Air is drawn from the outside through coils that are heated by exhaust steam from the engine. This air is discharged through large pipes that run directly beneath the ceilings of the foundry floors. The same blower system furnishes a supply of fresh air during the summer. In the roof above the foundry floor are four Swartwout revolving ventilators made by the Ohio Blower Company, Cleveland.

An abundance of light is provided by sections of windows which are eleven lights high on the foundry floor and five lights high on the lower floors. Sections of the metal sash are pivoted so that they can be opened for ventilation. The sash, which was furnished by the David Lupton's Sons Company, are fitted with 10 x 16-in. ordinary window glass. Artificial lighting for the foundry is provided by single 250-watt Mazda lamps set in reflectors and suspended as far down from the ceiling as possible without being in the way of the cranes. The lower floors are lighted with 150-watt Mazda lamps in reflectors set against the ceilings.

Special attention has been paid to the sanitary arrangements. On the second floor there is a lavatory which is provided with porcelain-lined iron wash bowls and four shower baths. A supply of hot water is furnished from a tank heated by steam supplied from the power plant. In addition to this lavatory there are toilet rooms on each floor.

Transporting a Large Press Cross-Head

Mention was made in *The Iron Age*, May 23, 1912, of a 10,000-ton hydraulic press which was being built by the Bethlehem Steel Company, South Bethlehem, Pa., for the Carnegie Steel Company's Schoen wheel plant at McKees Rocks, Pa. The press is said to be the largest in the world, and some idea of its magnitude will be gained from the fact that the total weight is 2,135,000 lb. The cap, which was illustrated in *The Iron Age* May 30, 1912, is a steel casting weighing 375,000 lb., and this is only one

car has trucks with 16 wheels at either end and these are connected by a bridge consisting of two girders in which the load is placed. In transporting the cross-head, it was suspended in the car so that there was a clearance of 6 in. between the bottom of it and the rail and the same distance between its top and the clearances of the tunnels and bridges along the tracks over which it was shipped.

Growth of Imports Surprises Washington

A press dispatch from Washington, under date of September 12, states that government officers and politicians who are students of economic and social conditions are one in voicing their surprise at the evidences of continued national prosperity and the indications that it will increase rather than diminish in face of political conditions that have heretofore almost invariably operated as a check upon good times. Acting Secretary James Freeman Curtis of the Treasury Department says:

"It looks as if the turbulent politics of a Presidential year and the prospect of an overhauling of the tariff schedules, for once in our history, cannot arrest our national prosperity. Customs receipts have been steadily increasing since the first of the year. Last January I was asked to submit an estimate on the state of the customs receipts as they would appear at the end of the fiscal year June 30, 1912. At that time there was a deficit of \$9,000,000 in customs revenues compared with the corresponding period a year before. There was nothing in the situation at that time to indicate an improvement in conditions. So when I submitted an estimate that there would probably be a deficit of \$18,000,000 in customs receipts for the fiscal year ending June 30 last, compared with the previous year, I felt my estimate was conservative.

"Shortly after January 1 the customs receipts commenced to increase. Instead of a deficit of \$18,000,000 on July 1, the customs revenues were but \$4,000,000 below what they were the year before. Since then the situation has improved until to-day, with less than three months of the



View Showing the Method Employed for Transporting the Cross-head for the Largest Press in the World, Built by the Bethlehem Steel Company, South Bethlehem, Pa.

of the several large steel castings and forgings required by the contract. The press is made almost entirely of steel and contains the largest hydraulic cylinder in the world, together with the largest copper liner ever made for this purpose. The cross-head is said to be an unusually sound steel casting, not even a pin hole or defect being visible in any place. The weight of this casting is approximately 250,000 lb. and its over-all dimensions are 200 x 135½ x 79½ in., the last figure being the height. The column slides in this casting are heavy manganese bronze and weigh several tons.

The problem of transporting the press was a somewhat difficult one, as there is only one car in existence which can be used for transporting the enormous pieces constituting its parts. For this reason it will require about three months to transport the press to its destination in the Pittsburgh district, and in the accompanying engraving the cross-head is shown en route. The car used was especially designed by the Bethlehem Steel Company for transporting pieces of this nature, and its capacity is 300,000 lb. As will be noticed from the accompanying engraving, the

new fiscal year gone by, our receipts are approximately \$10,000,000 more than last year and still increasing. At the present rate we should have, instead of a deficit for this year, a surplus of probably \$50,000,000 for the fiscal year ending June 30, 1913.

"The situation is all the more remarkable in view of the continued agitation for a revision of the tariff downward. A prospect of tariff legislation has had the effect in the past almost invariably to curtail importation and diminish custom receipts. But the prospect of tariff revision is just as imminent to-day or more so than at any time in the last three years and the increased importations that began in January were not spasmodic, but have continued to show a steady increase up to the present time. It is an unusual but gratifying situation. It proves that our national prosperity is so substantial and permanent that political agitation cannot disturb it."

The hearings in the Government's suit against the United States Steel Corporation will be resumed at Pittsburgh October 1 under Special Court Examiner Brown.

Economies in Foundry Mixing and Melting

Observations of a Machine Shop and Foundry Superintendent on Methods That Have Been Found to Reduce Cost and Increase Output

BY STUART DEAN*

[This article is the first of a series Mr. Dean has prepared for *The Iron Age*, dealing with shop and foundry management by the presentation of everyday methods that have resulted in lower cost and greater output. As superintendent of the Dean Brothers Steam Pump Works, Indianapolis, Ind., in the past twelve years, Mr. Dean has constantly aimed at four things: Reduction in cost of production, increase in plant capacity through greater efficiency, quick deliveries and a perfect product. In setting out to record some of the results of his experience, Mr. Dean planned to set forth in compact form what may be called the economics of shop operation; to indicate on what lines he had succeeded in increasing output in all departments and in reducing overhead expenses. The plant in which he has done his work employs about 200 men and is of the right size to enable the man in charge to learn all the practical details. It is no theory, therefore, that he presents, and extended discussion has been avoided, the purpose being to point out how and where money can be saved and the efficiency of the whole productive machine increased. Appropriately the first article deals with the foundry. Two others on foundry operations will follow, then five or six relating to machine shop operations. The whole might well be grouped under the general title, "Shop Methods That Paid Dividends."—EDITOR.]

The Making of Mixtures

There is a great saving in making the iron mixture of a foundry according to analysis. A well run foundry's labor cost may run somewhere around 1¼ cents per pound of castings turned out. All the material bought by this foundry may run a little over 1 cent for each pound of castings. A saving in the cost of material, by using two-thirds or more of off grade iron or scrap will reduce the cost of the castings as much as increasing the foundry output per man 10 per cent. Yet this foundry will try to strain the output per man up 10 per cent. and pay no attention to the heavy expense of running a mixture containing half costly pig iron.

A foundry using a minimum amount of coke in the cupola, so that the increase in sulphur from melting is only nominal, will be forced to use two-thirds cheap pig iron or scrap. To obtain a mixture in the casting of

- 1.80 silicon,
- 0.60 manganese,
- 0.60 phosphorus, and
- 0.12 sulphur,

more than two-thirds off grade iron will have to be used. The above analysis will make a fine iron, close-grained, strong and soft.

It is strange that all foundries do not make their mixtures by analysis. The essentials of the subject can be mastered in an hour's time. The condensed statement of iron mixing can be completely told on one page. It is true whole books are written on the subject by padding it out.

Permutations of the Five Metalloids

There are only five elements that affect the mixture: Three of these change during melting; the other two do not. Silicon and manganese reduce in amount and sulphur increases. It is a game played with a pack of five cards. What combination can be made with five elements?

When an element is present in an iron above the normal amount, it changes the quality of the iron in a fixed direction, provided the other elements are at the normal point.

Silicon high, other elements in casting average: Soft,

*Superintendent Dean Brothers Steam Pump Works, Indianapolis, Ind. Mr. Dean, who is a nephew of the proprietors, was put in charge of the Indianapolis plant twelve years ago at the age of 25. The product is pumps ranging from 50,000 lb. to 122 lb., some of them designed by the author, who also designed and built a number of special machines to turn out the work. Among these is a 6-ft. boring and milling machine having a 48-in. milling cutter head. Mr. Dean worked in every department of the Indianapolis plant. He had a common school and high school education. Working in the shop in vacations from an early age, before he was out of school he had learned the machinist's trade. At eighteen he quit school and went to work in the foundry, learning this trade. He was specially instructed in all branches of operation, with the idea of eventually taking charge.

fluid, spongy, weak. When in excess of 3.50 iron begins to harden.

Silicon low, other elements average: Hard, strong. Less internal sponginess.

Manganese high, other elements average: Soft, strong, clean, close-grained. Manganese is a scrap carrier. When very high, manganese begins to harden iron.

Manganese low, other elements average: Hard, weak, brittle castings.

Total carbon high, other elements average: The mixture can carry a lower silicon with good results.

Total carbon low, other elements average: Strong iron. Increases the length shrinkage.

Graphitic carbon high, other elements average: Soft, weak with internal sponginess.

Graphitic carbon low, other elements average: Strong, hard, no sponginess.

Combined carbon high, other elements average: Strong, hard, not spongy.

Combined carbon low, other elements average: Soft, weak and spongy.

Phosphorus high, other elements average: Fluid, weak and brittle. Pit holes on machined face if very high.

Phosphorus low, other elements average: Strong castings; molten iron sluggish in flowing.

Sulphur high, other elements average: Strong and hard, and sluggish in flowing.

Sulphur low, other elements average: Soft, but weak.

The proportion of the graphitic carbon to the combined carbon is purely a result of the proportion of the other elements, also the mold conditions.

Silicon and manganese high, other elements average, in a mixture with silicon 3 per cent. and manganese 1 to 1.50 per cent.: The silicon softens and weakens. The manganese offsets this and strengthens.

Silicon and manganese low, the other elements average: Hard, weak, brittle.

Phosphorus and sulphur high, other elements average: Weak, brittle castings.

Phosphorus and sulphur low, other elements average: Strong and soft.

Phosphorus high, manganese low, other elements average: Hard and weak.

	Silicon	Silicon.
Malleable iron	0.60	to 1.00
Car wheels	0.60	to 0.80
Cylinders	1.25	to 1.75
Machine castings, heavy.....	1.75	to 2.25
Machine castings, light.....	2.25	to 2.75
Ornamental castings	2.40	to 2.75
Stove plate	2.50	to 3.00

On heavy work 1.60 silicon will be less spongy than 1.90 silicon.

For heavy pressure oil cylinders (hydraulic pressure) bring the silicon down to 1 per cent. to make a dense iron.

Five per cent. of the silicon burns out in melting in the average cupola. This has to be figured when making a cupola mixture.

Castings made 40 or 50 years ago, such as cast iron building fronts, contain a higher percentage of silicon than the present day No. 1 iron. Such old iron is snapped up by the foundries that know this. It means getting No. 1 iron at scrap iron prices.

Manganese

Of all the elements this is the most desirable. It has no bad qualities and all the good qualities.

	Manganese.
Malleable iron	0.25 to 0.35
Car wheel iron.....	0.45 to 0.60
Cylinders	0.60 to 0.90
Machine castings, heavy.....	0.30 to 0.50
Machine castings, light.....	0.30 to 0.50
Ornamental	0.35 to 0.50
Stove plate	0.35 to 0.50

Manganese cleans, softens, closes the grain and offsets sulphur effects. Very high manganese removes sulphur.

High manganese with high sulphur will make a softer mixture than low manganese with low sulphur. This shows the power of manganese as a softener.

Manganese is a better softener than silicon, as it does not weaken the iron nor make it spongy. It is cheaper, as high manganese iron is sold at about standard price, whereas high silicon iron is sold at a premium.

For average work 0.60 per cent. manganese is probably the ideal point. As the manganese is increased from a low point up to 0.60, its softening effect is felt very strongly. Above 0.60 the effect is felt less and less as manganese is increased, until somewhere above 1 per cent. any increase fails to soften the iron.

Makers of automobile cylinders carry 1 per cent. manganese in the iron to keep the mixture soft and the silicon low, to prevent sponginess in the unequal sections of the casting.

From $7\frac{1}{2}$ to 20 per cent. of the manganese that is in the mixture charged into the cupola will be burned out in melting, depending on the cupola. In making up a mixture, allowance must be made for this.

A good way to raise the manganese is to buy manganese scrap and use it in the cupola.

Carbon Content

	Total Carbon.
Machinery castings....	3.50 per cent. and over
Ornamental	3.50 per cent. and over
Car wheel	3.50 per cent. and over
Cylinders	3.35 to 3.50 per cent.
Stove plate	3.30 per cent. and over
Malleable	2.00 to 2.25 per cent.

High total carbon makes a more spongy iron than low, other elements being average in amount. The higher the total carbon the softer the iron. Total carbon 3.75 per cent. and 1.50 silicon give a softer iron than 3.25 total carbon and 2.50 silicon. This shows the softening power of carbon. Low total carbon will produce excessive shortening of a casting and may crack it.

Northern and Southern irons differ principally in their total carbon and phosphorus. Northern iron has high total carbon and low phosphorus. Southern iron is low in total carbon and high in phosphorus.

Castings that cool quickly, either from being thin section, or from having a chill set in the mold, or from being poured with cold iron will be higher in combined carbon than those which cool slowly. This is the reason that a mixture that gives 0.50 combined carbon in castings $\frac{1}{2}$ in. thick will give 0.10 and 0.05 combined carbon in castings $1\frac{1}{2}$ in. thick. A mixture with 2 per cent. silicon in heavy work, and combined carbon 0.05 or 0.10 will change, by lowering the silicon to 1.50, to 0.50 combined

carbon. Any sponginess found in castings made of the first mixture would disappear using the second mixture. This shows that the proportion of combined carbon to graphitic carbon is a result of the proportions of the other elements.

A foundry troubled with internal sponginess will be obliged to use an iron mixture as near the hard point as the machine shop can stand. The silicon may have to be reduced to 1.50 per cent.

A cupola burns out the same fixed per cent. of silicon and manganese and adds the same fixed per cent. of sulphur to the iron day by day.

The mixture in the casting can be guaranteed except as to the carbons, knowing the analysis of the iron charged into the cupola, when the amount of change the cupola makes in the elements is learned from observation.

Phosphorus

From 0.8 per cent. to 1 per cent. phosphorus is desirable for fluidity in light castings.

High phosphorus weakens iron to a marked degree, especially if the manganese is low.

High phosphorus in medium and heavy castings often causes dirt.

Increase of phosphorus from a low point up to 0.60 per cent. makes a rapid change in fluidity, but not so rapid a change in weakness in the iron.

From 0.6 per cent. up, the change is not so rapid as the change in weakness. For average work 0.60 per cent. is probably the most desirable point. Carrying the phosphorus a little above normal will make the iron fluid and offset the sluggishness caused by high sulphur. High manganese being a strengthener will offset the weakening effect of the phosphorus.

Sulphur

The sulphur increase in melting iron comes from the sulphur in the coke.

A cupola running cold increases the sulphur more than a cupola running hot.

Of the sulphur in the coke 6 per cent. passes into the molten iron. This must be figured in making a mixture.

The sulphur in castings can be as high as 0.13 without any bad effect, provided the manganese is kept high enough to offset the sulphur effects. This is a valuable thing to know, as it opens up a field for melting off-grades of iron and scrap that will reduce the cost of the mixture.

High sulphur reduces sponginess in the heavy sections of castings. It produces sluggishness in running, which must be offset by increasing the phosphorus. The weakening effect from the increase of phosphorus will more than be offset by the strengthening properties of high sulphur.

Scrap Iron and Scrap Steel

A mixture of 66 per cent. scrap can be safely run continuously. I know of a hollow ware foundry that runs 75 per cent. scrap, also a pumping machinery firm that ran 75 per cent. scrap. These are two extremes on the casting line.

In certain markets it is cheaper to buy off-grades of pig iron than scrap. A very high proportion of this pig iron can be used.

Analysis of average scrap cast iron:

Silicon	2.00
Manganese	0.35
Phosphorus	0.70
Sulphur	0.10
Total carbon.....	3.50

We will call the above an average mixture in a casting. Average analysis of scrap steel:

Silicon	None
Manganese	0.50
Phosphorus	0.08
Sulphur.....	0.08
Total carbon	0.50

Steel scrap is very useful in a mixture to reduce the silicon. Suppose you wish to run a mixture of two-thirds scrap and the iron in the casting comes out 2.10 in silicon, and this makes a mixture that is too spongy and weak; add steel scrap to the mixture to bring the silicon down to 1.90, where you want it.

If a foundry can get the low silicon cheaper by buying off-grade iron instead of using steel, it is better to buy the off-grade iron.

Changes That Occur in the Cupola

Of the silicon, 5 per cent. in the mixture burns out.

Of the manganese, $7\frac{1}{2}$ to 20 per cent. burns out.

Of the sulphur in the coke, 6 per cent. is added to the mixture.

Suppose the silicon in the mixture in the cupola averages 2 per cent. Five per cent. of 2 is 0.10; 2 less 0.10 equals 1.90 per cent. The analysis of the castings would show 1.90 per cent. silicon.

Suppose observation shows that the cupola burns out 20 per cent. of the manganese, and suppose the iron charged in has an analysis of 0.75 per cent. manganese. Twenty per cent. of 0.75 is 0.15; 0.75 per cent. less 0.15 per cent. equals 0.60 per cent. The manganese in the castings will be 0.60 per cent.

If your coke has 0.75 sulphur in it, 6 per cent. of this would be 0.045. Now, if the iron that is put into the cupola, taking pig iron, scrap and all, averages 0.055 per cent. sulphur, 0.055 plus 0.045 gives 0.10. The mixture will have 0.10 per cent. sulphur.

Coke

Coke must be hard and in large lumps. If it is soft it will crush in the cupola and shut off the free passage of air and produce cold iron, and cold iron produces bad castings.

The higher the ash in coke the harder and the better; 8 to 12 per cent. ash is the best. Coke having lower ash, say, 5 to 8 per cent., is too weak to hold its burden.

Good coke runs 0.85 per cent. sulphur and under; the lower the better.

Taking Samples for Analysis

Casting Analysis.—Take eight gates from different parts of the heat. Drill them, being careful to throw away the first chips that might have sand in them. Mix the chips from the eight gates to get a true sample. Put them into an envelope and send to a thoroughly reliable chemist. Better choose one whose principal business is doing this work, for foundries, as the slightest error made by the chemist will lead to trouble.

Foreign Scrap Analysis.—Take chips from ten samples.

Coke Analysis.—Take chips from twenty pieces.

Here is the analysis of the castings of a firm which mixed satisfactorily by the old method of not using analysis. Its product was light castings:

Silicon	1.73
Manganese	0.66
Graphitic carbon	2.90
Combined carbon	0.49
Phosphorus	0.944
Sulphur	0.058

They had no idea the sulphur was so low. They might just as well have used a cheap off-grade iron, high in sulphur, which would have raised the sulphur up to 0.10 or even to 0.12 per cent.

Such an increase in the sulphur would necessitate the increasing of the silicon probably to 2 or 2.25 per cent., depending on how light the castings were, so as to offset the hardening effects of the higher sulphur. This change in the mixture would have reduced the cost of castings.

Cupola Management

Light fire after two-thirds of the bed coke is charged. Light at tuyeres, not at tap hole or the bed will burn ir-

regularly. After lighting, charge in the other third of coke.

Begin charging the cupola as soon as the coke is thoroughly red hot.

Have the cupola fully charged 30 minutes before the blast goes on—not sooner and not later. In this way the full benefit is derived from the heat of the fuel.

Remember, the hottest place is next to the wall of the cupola; therefore, put the coke and pig iron there only.

Tap out when the blast has been on 30 minutes.

Never let the taphole blow, as it allows slag to run into the ladle, and slag will finally get into the castings. Always carry a large body of melted iron in cupola. The tapped iron then will come from the bottom of the molten mass where it is absolutely clean.

Be sure the ladle is heated before the first tap. Make the taphole $\frac{7}{8}$ in. in diameter. The small taphole makes it easy to handle the iron under pressure in the cupola.

Close taphole with molding sand before blast goes on. This will preserve the bed coke and also will save some iron that is usually wasted.

Slag out after 50 minutes or after 7000 lb. on heats 12,000 lb. or over. Slagging will prevent the cupola closing up, thereby giving hot iron at the end of large heats.

Metal and Fuel Charges

Make the first charge of iron double the weight of those that are to follow. The coke in the bed is sufficient to melt it. Reduce the coke charges day after day until cold iron begins to result; then increase them a little.

Use steel scrap on first charge and pour the heavy castings with this iron. Steel is necessary in heavy castings to make them solid, because the silicon must be brought down low. All shop steel scrap melted in the cupola is clear gain for the foundry—material for nothing.

If you wish to melt cast iron borings put 100 lb. in a sack and charge in the center of the cupola under the scrap—borings on the coke, scrap on top of the borings. Start in with 5 per cent. borings and gradually increase this day by day until 10 per cent. is reached. This material is no expense to the foundry and is clear gain.

Charge the coke, if it is good, to 24 in. above top of tuyeres.

One pound of coke in bed should melt three pounds of iron.

Use the least amount of coke possible. Excessive coke produces slow melting, raises the sulphur in the castings, and increases the material expense of running a foundry.

Coke that looks like the inside of a wasp's nest is not good. It makes slag.

Flux is not generally needed. Limestone is better than fluorspar. Fluorspar makes the flux so thin that it will flow with the iron and get into the mold. Use 30 lb. of limestone to 1200 lb. of iron.

Causes of Cold Iron

Cold iron raises the sulphur in castings.

Cold iron produces blow holes in machined faces.

Cold iron makes shrink holes under the risers.

Cold iron from cupola is caused by:

Bed coke pieces being too small.

Wood in bed not dry.

Wood in bed longer than 2 ft.

Wood in bed not level.

Coke in bed and in charges not level.

Coke in charges when not put around the edge, but in the center, will make cold iron. Fork the coke in; do not pour it in.

Pig iron must be charged around the edge where the blast hits it, or cold iron will result.

Cold iron is produced from wet sand put in the cupola bottom.

Cold iron is produced when scrap is used in too large pieces. This cuts off the draft in the cupola.

Cold iron is produced by not charging scrap in the center of the cupola.

Cold iron is made by not charging the iron level.

Cold iron will result if the ladle is not heated before the first tap.

Cold iron is produced if coke is lit too early.

Cold iron is produced if iron begins to melt before blast goes on.

Distribute the shot iron throughout the charge evenly; not all in one charge, or it will act as a damper.

Hot Iron

Hot iron feeds the casting better, giving less sponginess in casting.

Hot iron makes the casting solid under risers.

Hot iron makes clean castings.

Hot iron makes soft castings and castings free from blow holes.

Hot iron reduces sulphur.

Dry bottom sand gives clean, hot iron.

Two-ft. pieces of wood or shorter give hot iron.

Dry wood leveled gives hot iron.

Use large coke in bed. A level bed gives hot iron.

Use small pieces of iron. If pigs are broken, especially for first charge, it will make hotter iron and reduce the coke.

Scrap in the center gives hot iron.

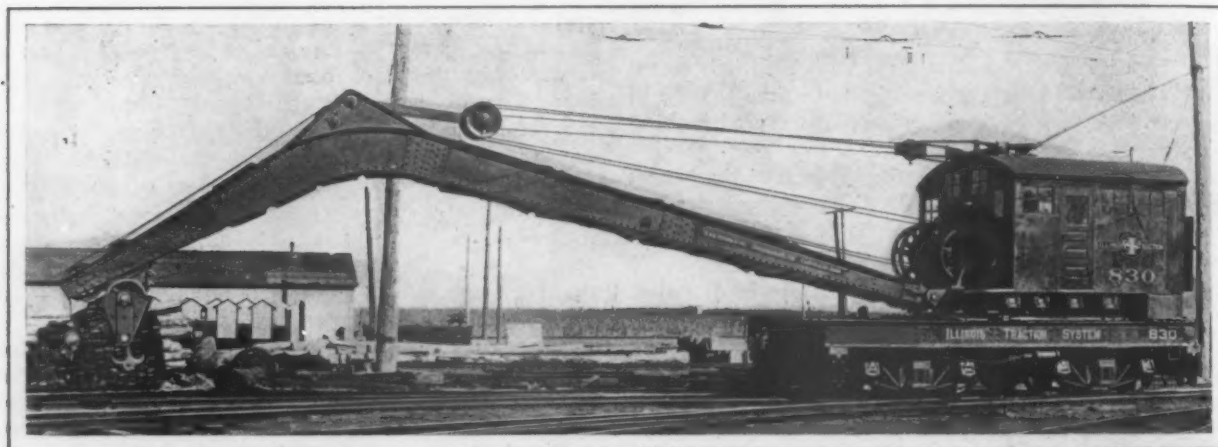
Scrap not too large gives hot iron.

their field man, free of charge, to teach the cupola tender the best way to run the cupola and the correct sizes of charges of coke and iron, etc. The field men are old practical foundrymen who have come up from the ranks. Troubles can be unloaded on them to be corrected. The price they charge is only nominal. The saving they make will pay for their services ten times over.

An Electric Railroad Wrecking Crane

Among the many advantages and economies obtained by the use of electric motors as compared with steam engines for operating railroad cranes may be mentioned the fact that an electric crane is always ready for duty which is an essential of any serviceable crane, there is no time wasted in getting up steam, which frequently is a serious handicap for steam cranes, and the power is consumed only when the crane is being actually operated. A typical example of the many electric cranes now in use is the one which is owned and used by the Illinois Traction Company for wrecking purposes on its Danville & Urbana division.

This crane was furnished by the Browning Engineering Company, Cleveland, Ohio, and is equipped with a 30-ft. gooseneck boom having a main and an auxiliary hoist. The radius of the former is 25 ft. and that of the latter is 5 ft. greater. The maximum lifting capacity of the main hoist is 30 tons at a 12-ft. radius and 11½ tons at



An Electric Railroad Wrecking Crane Built by the Browning Engineering Company, Cleveland, Ohio.

General Directions

At the end of the heat the iron that is left over should be poured into a clean cast-iron pig bed, rather than on the floor. This will save the labor of breaking up the slab iron, put it into better melting form and keep it clean.

Remember, most of the dirt that is thrown into the cupola comes out of the tap hole, and some of it goes into the castings.

Be sure to oil the surface of the cast iron pig chili to prevent the flying of iron.

Blast pressure should be 8 to 14 oz.

Clay only ¾ in. thick on the wall of the cupola gives clean iron.

Stiff, dry clay for daubing gives clean iron.

Be sure to skim slag from ladles before starting to pour.

Make slag hole 2 in. in diameter, 1½ in. in length.

Put slag hole 2 in. lower than lowest tuyere.

Take out everything not used each day from the cupola top room. The day's heat can then be stored upstairs in wagons.

Analysis and Expert Advice

Reputable firms of analytical chemists make a business of taking care of foundries. They make contracts by the year for analyzing samples from heats, coke, pig iron, scrap iron, or anything else, and give advice as to the best iron mixtures, for a fixed yearly sum. Besides this, they send

its maximum radius. The hook speed of the auxiliary hoist is 200 ft. per min., while that of the main hoist is 50 ft. The over-all dimensions are height, 13½ ft.; width, 118 in., and length, 24 ft. The wheels, which are 33 in. in diameter, are of the M. C. B. rolled steel type and the distance between truck centers measures 182 in.

The motors used with this crane are the Westinghouse No. 303 railroad type and since they operate on direct current they are equipped with commutating poles. The control apparatus, which is designed so that the crane can be handled by one man, was also furnished by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. The power is taken from the overhead trolley wires and is led to the controller through a collector ring on the rotating base and a shoe on the stationary one. Metal and fibre conduits are used to incase all the wiring so that it is protected from moisture and mechanical injury. The crane is self-propelling at the rate of 600 ft. per min.

The Peninsular Steel Castings Company, Detroit, Mich., has been organized for the purpose of manufacturing crucible steel castings under the F. J. Nice patents. The new company has acquired a plant at Wight and Iron streets and is remodeling it and installing equipment with the expectation of beginning operations within 60 days. Harrison Geer is president; Guy R. Creelman, vice-president; Matthew Finn, secretary and treasurer, and J. H. Tobin, Jr., superintendent.

The Use of Vanadium in Steel Castings

Results of Extended Investigations Show Greater Strength, Higher Elastic Limit and in Low Carbon Steel Increased Dynamic Value

BY EDWIN F. CONE

A great deal has been written regarding vanadium, the new "wonder-element," and its effect on various grades of steel, especially forgings—the unusual static and dynamic results arising from its incorporation in steels with or without other alloyed elements such as chromium. However, comparatively little has been published about the effect of vanadium on steel castings. In view of the fact that the demand for vanadium castings is constantly growing, the following study, based on observations extending over a considerable period and established by actual tests and experiments on acid steel, may be of interest.

Method of Use

There is no secret about the method of manufacture. The vanadium can be obtained from various producers in the shape of an alloy of iron and vanadium, having a vanadium content of 31 to 34 per cent. and a melting point below that of steel. The alloy said to produce the best results is made from various vanadium ores by the aluminum electric reduction process, which produces an alloy of iron and vanadium free from carbon, an essential property of an easily workable alloy of vanadium. This alloy is added, either in the furnace just before the heat is drawn or in the ladle as the heat is running from the furnace, in sufficient quantities to produce a steel having a minimum of 0.16 per cent. Va. and a maximum of 0.20 per cent. Va.,

gates, etc. If the vanadium scrap of this nature is carefully separated and re-charged in new vanadium heats, there will be found in the metal of the bath, after complete melting, about 0.03 to 0.05 per cent. Va., which can be counted on as being incorporated in the final steel as produced, thus saving appreciably in the amount of fresh alloy needed to secure the desired vanadium content in the steel. This has been established by the writer in the case of the analysis of several heats.

The appearance of the metal while pouring and its behavior in the molds are the same as with ordinary carbon castings.

The loss of the alloy in the furnace, due to scavenging properties, becomes in time almost a negligible quantity, probably because of the use of vanadium scrap in the initial charge. In the early stages of the production of vanadium steel, an allowance for a loss of 25 per cent. of the vanadium was made, but the writer has found that this is unnecessary. In the production of 118 heats, the average percentage of vanadium charged was 0.214 per cent., and the average percentage of vanadium in the steel was 0.20. Allowing for the vagaries of analyses and discrepancies in weights, this apparent loss is nothing.

The question occurs, whether there is any segregation of the vanadium in a heat. All tests made on a large number of heats, including many from the same heat, revealed a uniformity that

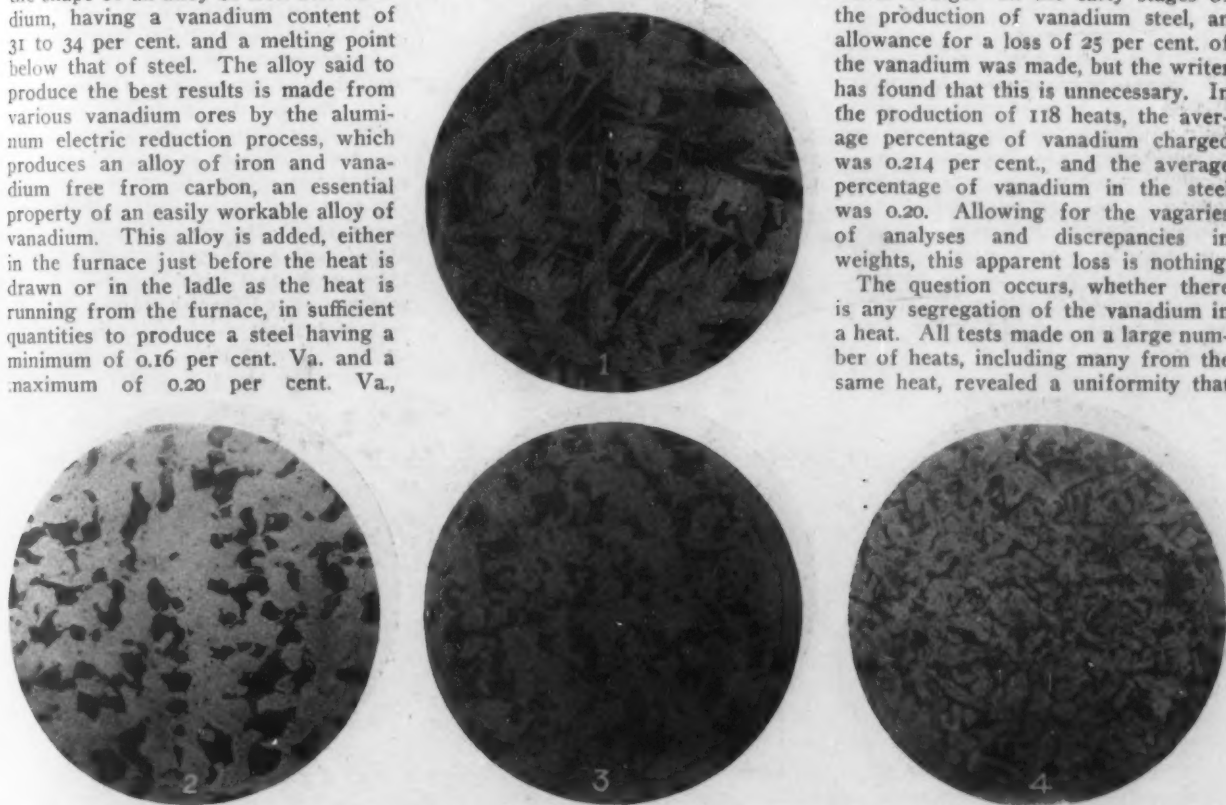


Fig. 1. Ordinary carbon steel casting, unannealed.

Fig. 2. Ordinary carbon steel casting, annealed.

Fig. 3. Vanadium steel casting, unannealed.

Fig. 4. Vanadium steel casting, unannealed, of the following

composition and properties: Carbon, 0.29 per cent.; manganese, 0.62 per cent.; vanadium, 0.251 per cent.; tensile strength, 99,000 lb. per sq. in.; elastic limit, 41,000 lb. per sq. in.; elongation, 11 per cent. in 2 in.; reduction of area, 13.4 per cent.

PHOTOMICROGRAPHS AT 60 DIAMETERS OF UNANNEALED VANADIUM STEEL CASTINGS COMPARED WITH THOSE OF ANNEALED AND UNANNEALED CARBON STEEL CASTINGS

though a higher percentage is said to do no harm, being merely a waste. There seems to be a difference of opinion as to whether adding the alloy to the furnace bath or to the ladle produces the better metal. Those following the former method contend that that metal is the best which is finished and mixed so far as possible in the furnace itself. It is not possible to state definitely from my own experience which method is the better. Observation of many heats made both ways could detect no appreciable difference in the appearance of the castings in their chemical, static, dynamic, or microscopic characteristics. The safe presumption, however, is in favor of adding everything in the furnace.

Vanadium Losses and Gains in Practice

It has been established conclusively that a small amount of vanadium is recoverable in remelting the scrap. It is the practice of all steel foundries to re-charge their heads,

would argue against segregation. But this fact is not yet clearly established.

Physical Characteristics

The appearance of the castings themselves is no different from that of other castings; but as soon as heads and test bars are broken off a decided difference is detected. The grain of the steel has been closed up and the appearance of the fracture to the eye is one that more nearly resembles an annealed steel casting than the coarse granular fracture of green ordinary carbon steel, or the still very much coarser and characteristic fracture of a green nickel steel casting. The steel is also more brittle in this freshly cast condition than in the ordinary steel casting. In drilling it to obtain borings for analysis, it is found also that the steel is tough, forming drillings that are very light and thin—a characteristic of vanadium steel when unannealed. It is surprising to what extent the incorporation

of so small an amount of vanadium has changed the ordinary characteristics of steel castings. But these changes are better understood when a microscopic study of the steel is made, as is explained later on.

Chemical Characteristics

In the ordinary analysis of vanadium steel for the carbon, manganese, silicon, sulphur, and phosphorus content, vanadium does not interfere, even with carbon by color. Only one distinguishing characteristic has been noted, i.e., when five grams of the steel are dissolved in dilute hydrochloric acid in the usual evolution method for sulphur analysis, there is deposited a black precipitate in the bottom of the flask in which the steel is dissolved. This precipitate is decided, and by it it is possible to detect without fail which one of a number of heats of steel is vanadium. It is probable that the black precipitate is carbides of vanadium, though the writer has not had time to determine this point conclusively.

It is not possible here to discuss the question of the best method for determining vanadium. It is perhaps sufficient to say that there is no method which is absolutely accurate and reliable. The writer had occasion to submit one carefully selected sample of a vanadium steel casting to six different chemists, one of them of well-known standing as a consulting firm. Results varying from 0.22 to 0.307 per cent. vanadium were returned, and each analyst maintained he was right. For practical operating purposes it is probable that the ether separation, including the isolation of the vanadium as a lead salt and its subsequent titration with a potassium permanganate solution is efficient and sufficient, though even here the personal equation is an important factor. The evolution of vanadium analysis has not reached the stage of development of some of the other steel methods.

same relative composition and the same relative heat treatment! In this study of the subject the writer takes for illustration one particular heat which has been subjected to various tests and experiments; but it can be stated positively that all the facts ascertained about this one heat have been subsequently borne out by the behavior of many others. The heat taken for illustration had the following composition:

	Per cent		Per cent
Carbon	0.29	Sulphur	0.043
Manganese	0.62	Phosphorus	0.032
Silicon	0.289	Vanadium	0.251

Some characteristic physical tests from this heat are shown in the following table:

	Elastic limit, lb. per sq. in.	Tensile strength, lb. per sq. in.	Per cent elong. in 2 in.	Per cent red. area.	Fracture.	Per cent E. L. of T. S.
Unannealed	41,000	99,000	11	13.4	Granular	
Under-annealed ..	55,000	88,000	16	22.4	3/4 Granular	
	47,000	89,000	15	20.6	3/4 Granular	
Well annealed ..	50,700	76,000	21	40.3	Silky	66.7
	45,000	77,000	22	35.7	Silky	58.4
	47,000	77,500	23.5	34.1	Silky	60.6

Av. 61.9

In comparing the static tests of the unannealed with the regularly annealed vanadium steel castings, it is found that the unannealed has a much higher tensile strength and lower ductility than the properly annealed steel, and also that the same holds true of the under-annealed, i. e., steel that has not been heated above the recalescence point during the annealing. Now when these facts are compared with the same conditions in ordinary carbon steel castings, the direct opposite is the case, i.e., unannealed steel has a lower tensile strength than the annealed and sometimes a higher ductility, while that which has been only partly annealed furnishes some of the best of static results. This is shown by the following table:

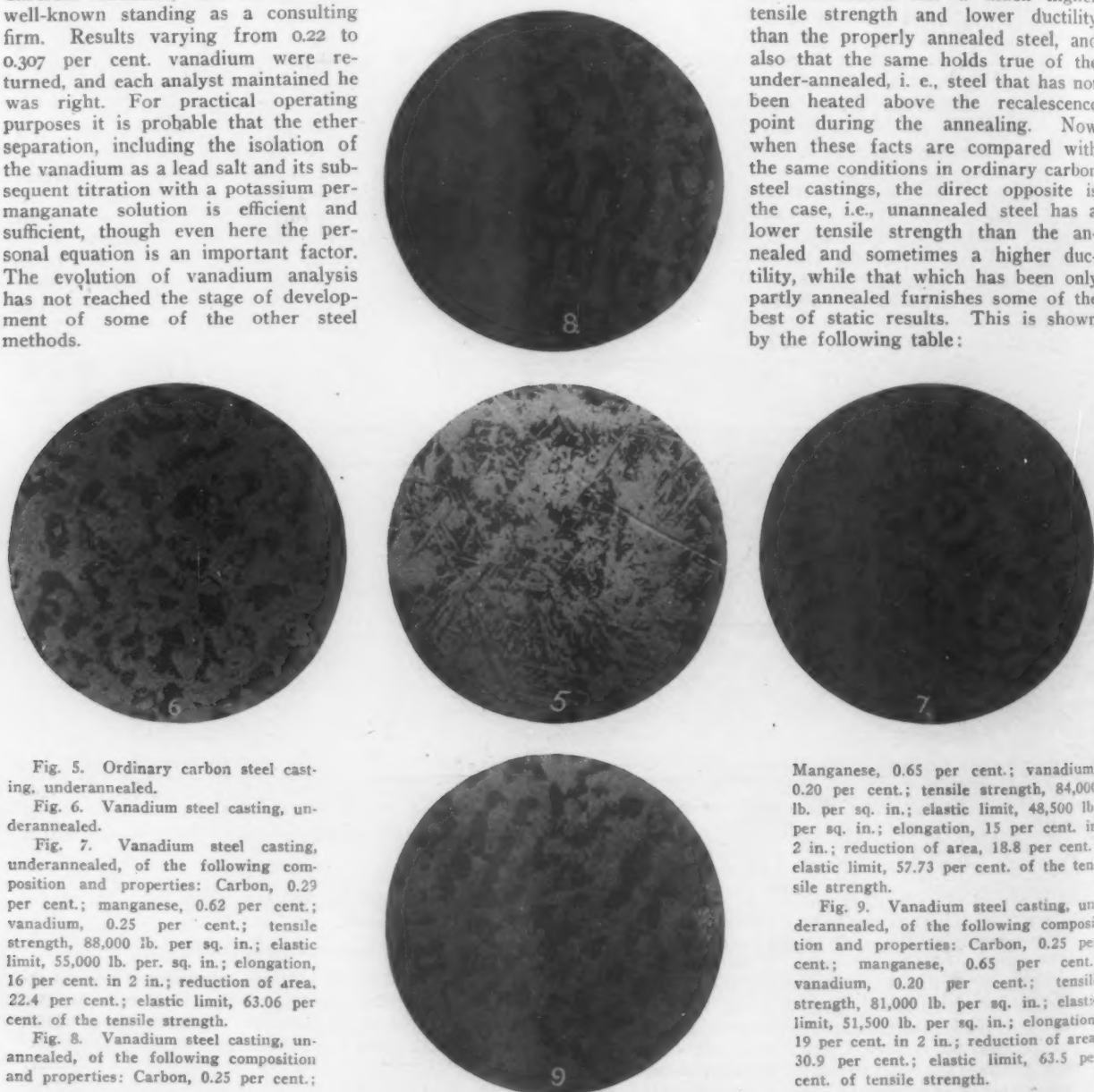


Fig. 5. Ordinary carbon steel casting, underannealed.

Fig. 6. Vanadium steel casting, underannealed.

Fig. 7. Vanadium steel casting, underannealed, of the following composition and properties: Carbon, 0.29 per cent.; manganese, 0.62 per cent.; vanadium, 0.25 per cent.; tensile strength, 88,000 lb. per sq. in.; elastic limit, 55,000 lb. per sq. in.; elongation, 16 per cent. in 2 in.; reduction of area, 22.4 per cent.; elastic limit, 63.06 per cent. of the tensile strength.

Fig. 8. Vanadium steel casting, unannealed, of the following composition and properties: Carbon, 0.25 per cent.;

Manganese, 0.65 per cent.; vanadium, 0.20 per cent.; tensile strength, 84,000 lb. per sq. in.; elastic limit, 48,500 lb. per sq. in.; elongation, 15 per cent. in 2 in.; reduction of area, 18.8 per cent.; elastic limit, 57.73 per cent. of the tensile strength.

Fig. 9. Vanadium steel casting, underannealed, of the following composition and properties: Carbon, 0.25 per cent.; manganese, 0.65 per cent.; vanadium, 0.20 per cent.; tensile strength, 81,000 lb. per sq. in.; elastic limit, 51,500 lb. per sq. in.; elongation, 19 per cent. in 2 in.; reduction of area, 30.9 per cent.; elastic limit, 63.5 per cent. of tensile strength.

PHOTOMICROGRAPHS OF UNDERANNEALED AND UNANNEALED VANADIUM STEEL CASTINGS COMPARED WITH AN UNDERANNEALED CARBON STEEL CASTING, ALL AT 60 DIAMETERS

Static Characteristics

In studying the tensile and other static qualities of vanadium steel castings, the clearest method of procedure is to compare it with ordinary carbon steel castings of the

	Elastic limit.	Tensile strength.	Per cent elong. in 2 in.	Per cent red. area.	Per cent E. L. of T. S.
Unannealed	36,000	70,000	22	30.9	51.43
Under-annealed ..	37,000	73,500	27	44.4	50.34
Well annealed	37,500	74,500	24	40.3	50.33

The chemical composition of the two heats here contrasted is practically the same, aside from the vanadium, i.e., 0.29 per cent. carbon. The effect of the presence of vanadium on the elastic limit is marked. In an ordinary carbon steel casting the ratio of elastic limit to tensile strength is usually from 50 to 52 per cent., but when vanadium is present the ratio is increased to at least 60 per cent., as is evidenced by the two tables just cited. In averaging up the results of a little over 400 static tests of annealed vanadium steel castings, the elastic limit was found to be 60.03 per cent. of the tensile strength. In view of the fact that the nearer the elastic limit of a steel approaches the tensile strength, the better the steel, the beneficial effect of vanadium is manifest.

The effect of the presence of vanadium on the tensile strength varies according to conditions of heat treatment, carbon content, etc. The general tendency is to raise it at least 10 per cent. This is especially manifest in low or in high carbon heats as is evidenced by the following tables:

		Elong. in 2 in., per cent.		R. A., per cent.		C.	Mn.	Si.	S.	P.	Va.
E. L.	T. S.	cent.	per	cent.	per						
39,500	70,500	28.0	50.6	0.18	0.58	0.254	0.041	0.032	0.208		
56,000	88,000	21.5	38.8	0.31	0.76	0.297	0.042	0.030	0.170		

To illustrate to what extent the vanadium has increased the tensile strength the following table shows the physical results of steel of corresponding composition, without the vanadium, other conditions being equal:

		Elong. in 2 in., per cent.		R. A., per cent.		C.	Mn.
E. L.	T. S.	cent.	per	cent.	per		
30,300	59,000	35	60	0.18	0.58		
39,000	76,000	26	44	0.31	0.76		

The effect of the presence of vanadium on the percentage of reduction of area is peculiar. It is found by the writer that, other conditions of composition and heat treatment being equal, the higher the carbon, the lower the reduction of area. This fact has been established beyond doubt by many carefully observed tests. As an illustration, the following table will suffice:

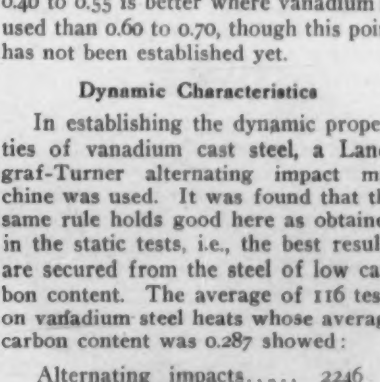
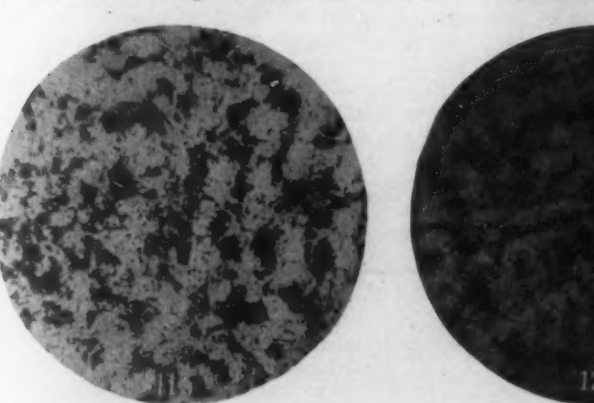


Figure No.	10	11	12	13
Carbon, per cent.	0.29	0.29	0.33	0.30
Manganese, per cent.	0.62	0.62	0.75	0.71
Vanadium, per cent.	0.251	0.251	0.165	0.17
Tensile strength, lb. per sq. in.	73,500	76,000	87,000	77,000
Elastic limit, lb. per sq. in.	44,000	50,700	46,500	53,000
Elongation, per cent. in 2 in.	27.5	21	23.5	26
Reduction of area, per cent.	40.3	40.3	37.2	48.3
Elastic limit, per cent. of tensile strength.	59.86	66.70	53.43	68.8

PHOTOMICROGRAPHS OF THOROUGHLY ANNEALED VANADIUM STEEL CASTINGS

E. L.	T. S.	Elong. in 2 in., per cent.	R. A., per cent.	Per cent of T. S.	C.	Mn.	Va.
High Carbon							
48,500	88,500	21.0	35.4	54.80	0.31	0.76	0.170
46,000	79,000	22.5	34.1	58.23	0.30	0.70	0.210
44,500	75,500	24.5	39.4	58.94	0.29	0.70	0.214
48,000	82,000	22.5	37.2	58.53	0.27	0.70	0.181
Low Carbon							
42,000	69,500	28.0	50.6	60.43	0.21	0.60	0.183
41,000	69,500	27.5	51.4	59.00	0.21	0.60	0.183
46,000	79,000	29.0	50.6	65.70	0.20	0.52	0.202
46,000	70,500	31.0	51.1	65.20	0.20	0.52	0.202

1 in. x 1/2 in. from vanadium steel castings do not bend as well as those from ordinary carbon steel, other things being equal. It is a regular thing to secure a cold bend of 180° from the latter, whereas in vanadium steel cast bars this is not so easy, unless the carbon content is low.

From an observation extending over a large number of heats of various composition, it is concluded definitely that the best static results on vanadium steel castings are obtained from those mixtures which contain a relatively low carbon content, while excellent results can be obtained from a carbon content around 0.30—results showing a high elastic limit; nevertheless the heat treatment necessary is one requiring extreme care, if not special procedure, and the resultant ductility as expressed in elongation in 2 in. is relatively lower than that obtainable from low carbon content. Especially is this true of reduction of area. Foundries having the best results with the use of vanadium will be those producing heats of low carbon content. It is true that it is at times difficult to meet the present railroad specifications with a low percentage of carbon, for some require a minimum of 75,000 lbs. tensile strength with an elongation of 20 per cent. in 2 in. and 35 per cent. reduction of area. Nevertheless, all things considered, relatively low carbon content is the safest vanadium practice for steel castings. The writer is also strongly inclined to the opinion that a manganese content of 0.40 to 0.55 is better where vanadium is used than 0.60 to 0.70, though this point has not been established yet.

Dynamic Characteristics

In establishing the dynamic properties of vanadium cast steel, a Landgraf-Turner alternating impact machine was used. It was found that the same rule holds good here as obtained in the static tests, i.e., the best results are secured from the steel of low carbon content. The average of 116 tests on vanadium steel heats whose average carbon content was 0.287 showed:

Alternating impacts..... 2246

whereas on steel of an average content of 0.23 C. the result was:

Alternating impacts..... 2520
A heat of 0.21 C. content showed:
Alternating impacts..... 2693
These results are all from steel of the same average heat treatment, i.e., thorough penetration above the recalescence point and then slow cooling in a closed annealer.

Metallographic Characteristics

Under the microscope a vanadium steel casting has an entirely different appearance from carbon steel under the same conditions of heat treatment, etc. Taking for illustration the same heat which was referred to under the discussion of the static characteristics, we find that the micro-

These tests could be multiplied indefinitely. Regarding cold bending tests: It is found that bars

structure of the green unannealed steel has a very close resemblance to that of the carbon steel after annealing. This is a surprising condition, i.e., that the mere presence of so small a percentage of vanadium should bring about such a marked change in the crystalline structure. Fig. 1 represents ordinary carbon steel in the green state, and Fig. 2 the same steel after annealing by what is known as the slow-cooling process. Figs. 3 and 4 show the vanadium steel heat above mentioned in the green unannealed condition, and the decided resemblance of these to Fig. 2, the annealed ordinary carbon steel, is striking. There are present none of the long laminated ferrite crystals, and this may account for the higher strength of the green steel.

In examining this same steel in the under- or partly annealed condition, we find the same differences. Fig. 5 shows ordinary carbon steel in the under-annealed state and Figs. 6 and 7 the same vanadium heat in a corresponding condition of heat treatment. In the one case the change in microstructure is noticeable, whereas with the vanadium, the crystalline condition still resembles the annealed steel. As a further illustration of these facts, Fig. 8 represents the microstructure of still another vanadium heat in the green, while Fig. 9 represents the same heat partly annealed.

The thoroughly annealed vanadium steel has usually a distinguishing microstructure, though one does not find it in every case. Figs. 10 and 11 reveal the microstructure of

degree from steel of low carbon and, perhaps, low manganese content. Also low carbon and manganese content steel gives safer castings, i.e., less brittle ones, should the heat treatment by any chance be poor.

The foregoing study of this subject is based on acid open hearth steel castings made in an eastern Pennsylvania foundry. The test coupons were uniform in size, location, and conditions of pouring, and there was the same average heat treatment, i.e., thorough heat permeation above the recalcence point and then slow cooling in the closed annealer.

Award for Safety Appliance Exhibit

Youngstown Sheet & Tube Company Receives Medal

The American Museum of Safety, 29 West Thirty-ninth street, New York, has advised the Youngstown Sheet & Tube Company, Youngstown, Ohio, that a commemorative medal has been awarded to that company by the International Exposition of Hygiene at Dresden, Germany, in 1911, for its exhibit as displayed and interpreted by the American Museum of Safety in its specialized exhibit in accident prevention, industrial hygiene and mutuality at Dresden. This exhibit now forms a part of the permanent collection in the great Museum of Safety at Berlin, Germany. This is particularly gratifying to the American Museum of Safety, inasmuch as it is the first

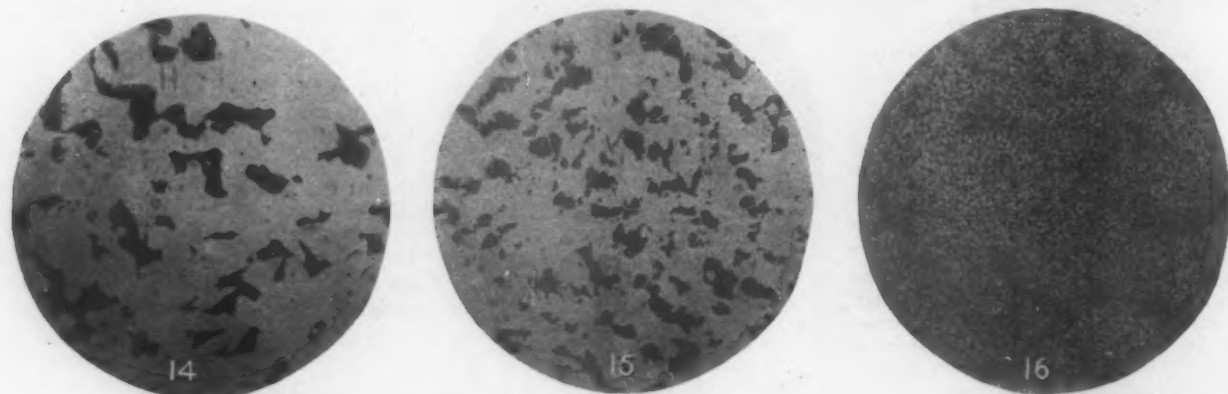


Fig. 14. Unannealed low-carbon vanadium steel casting; carbon, 0.18; manganese, 0.59; vanadium, 0.208.

Fig. 15. Annealed low-carbon vanadium steel casting; carbon, 0.18; manganese, 0.59; vanadium, 0.208; tensile strength, 70,500 lb.;

elastic limit, 39,500 lb.; elongation, 28 per cent. in 2 in.; reduction of area, 50.6 per cent.; elastic limit, 56.03 per cent. of tensile strength.

Fig. 16. Vanadium steel casting given special heat treatment.

PHOTOMICROGRAPHS OF VANADIUM STEEL CASTINGS, ALL AT 60 DIAMETERS

our original heat. It will be noticed that there is a more finely divided distribution of the ferrite and pearlite crystals—more of an interlacing; this is due primarily to the incorporation of the vanadium itself in the ferrite constituents. Figs. 12 and 13 show again this characteristic structure in two different heats which have excellent static qualities also.

The crystalline structures thus far dealt with represent steels of a moderately high carbon for vanadium steel castings, i.e., from 0.25 per cent. up. When we come to examine a vanadium steel of low carbon, i.e., below 0.23 per cent., we find a slight variation in crystalline arrangement. Fig. 14 shows an 0.18 per cent. C. vanadium steel heat in the green condition and Fig. 15 the same heat annealed. The former steel conforms to the general observation that the green steel is like the annealed ordinary carbon, but the latter only partly resembles the usual vanadium annealed structure.

If a vanadium steel casting is subjected to special heat treatment, i.e., quick cooling in the air from above the recalcence point, a structure is obtained represented by Fig. 16. The merits and demerits of this method of annealing steel castings are still an open question with the writer.

Summary

In recapitulation it can be said that the effects of vanadium on steel castings are:

1. Increased ratio of elastic limit to tensile strength.
2. Increased tensile strength.
3. Increased dynamic value in low carbon steel.
4. Probably a purer steel by reason of the removal of oxygen and nitrogen.

The above beneficial results are secured in the greatest

time that any non-German exhibit has been installed at the Berlin museum.

The exhibit which received this honor consisted of a great number of photographs taken in various departments of the works of the Youngstown Sheet & Tube Company, showing accident prevention devices and signs throughout the plant, illuminated signs at the entrances to the works and shields of all descriptions protecting machine tools, mill tables, cranes and other machinery. The exhibit also contained specimens of enameled signs, together with a few models of some of the more important accident prevention devices. There were also a number of books explaining the voluntary accident compensation plan and books of rules and regulations covering the safety of the employees.

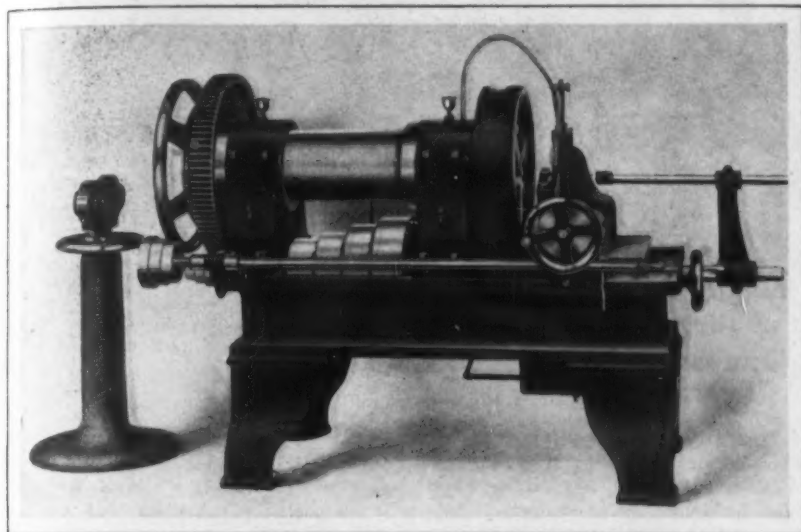
Steel Fabricating Plant at Toronto

The plant of the old Canadian Shipbuilding Company at the foot of Bathurst street, Toronto, has been purchased from the Canadian Bank of Commerce by John E. Russell and three other Toronto men, who are now applying for a charter. It is their intention to reopen the works without delay for the manufacture of structural steel. The company will also engage in tank and kindred work at first, but it will eventually branch out into marine work. When the Canadian Shipbuilding Company was operating the plant, six or seven years ago, it was one of the biggest shipbuilding yards in Canada.

The Elwell-Parker Company, Cleveland, Ohio, is filling an order for 50 electric freight trucks from the Lehigh Valley Railroad Company for use in its lake freight house at Buffalo. The trucks have a capacity of three tons each.

An Improved 6-In. Cutting-Off Machine

Several improvements have been recently made in the design of the 6-in. cutting-off machine built by the W. P. Davis Machine Company, Rochester, N. Y. These include a geared scroll chuck on the rear end of the spindle, which is operated by a handwheel instead of a pin, which was the former construction and a substantial splash guard over



The Improved Type of 6-In. Cutting-off Machine Built by the W. P. Davis Machine Company, Rochester, N. Y.

the front chuck to keep the cutting compound from spattering on the floor. The advantage claimed for the substitution of the handwheel for the pin is that the operator can make adjustments of the chuck without wasting the time necessary to locate the openings for the pin which were spaced 90 deg. apart in the old construction.

The driving cone pulley on this tool is mounted in the bed and the main spindle which is above it is driven through a gear and pinion. An automatic throw-off, which disengages the feed when the piece is cut off, is supplied, together with an adjustable gauge, so that pieces can be duplicated and cut to an exact length. The rear tool is used to cut out the center only and this does away with the friction at the side of the cut which it is pointed out makes it possible to cut faster and with less friction. Both tools are adjustable and the tool posts are mounted on a slide which permits the tools to be adjusted longitudinally. The bed of the machine has a receptacle for the oil and the chips and a strainer is provided to separate them so that the former can be used over and over again. The floor stand is made with roller bearings and there is a handwheel adjustment to set it to the proper height. The countershaft used for driving the machine has two friction pulleys and these, in connection with the four-step cone pulley, give eight changes of speed which can be accelerated as the cutter nears the center by a lever without stopping the machine.

The following table gives the principal dimensions and specifications of the machine:

Size of hole in spindle, in.....	6 3/4
Diameter of main spindle bearings, in.....	8 3/4
Length of main spindle bearings, in.....	7
Diameter of smallest cone pulley step, in.....	8 1/2
Diameter of largest cone pulley step, in.....	14 1/2
Width of driving belt, in.....	3 1/2
Diameter of friction pulleys on countershaft, in.....	14
Face width of friction pulleys on countershaft, in.....	5 3/8
Minimum speed of countershaft, r.p.m.....	150
Maximum speed of countershaft, r.p.m.....	250
Floor space, in.....	36x72
Net weight, lb.....	3,000
Shipping weight, lb.....	3,730

The regular equipment furnished with the machine includes two chucks, a floor stand for supporting long bars, countershaft, wrenches, oil pump, two tool posts and the necessary cutting tools.

The Anderson Wire & Steel Company, Anderson, Ind., has been incorporated, with \$150,000 capital stock, to manufacture wire fencing, etc. The directors are A. C. Shimer, M. B. Jones and G. S. Parker. It will buy the plant of A. C. Shimer.

The United States Motor Company Fails

The long expected collapse of the United States Motor Company, the second largest combination of automobile manufacturers in this country, occurred September 12, when W. E. S. Strong and Roberts Walker were appointed receivers. This action was the direct result of proceedings brought by the Brown & Sharpe Mfg. Company, creditor for more than \$70,000, its action having the approval of a merchandise Creditors' Committee which has been acting in behalf of some of the largest creditors. The company was threatened with insolvency last June, when a number of claims fell due, but the receivership was avoided for the time being by the granting of a 90-day extension by the principal creditors. As shown by the bill of complaint filed, the aggregate current liabilities are about \$12,000,000. Quick assets are about \$9,250,000, including about \$2,000,000 in automobiles about ready for sale. The plants and equipment are valued at about \$6,250,000.

It had been known for some weeks that the company would have to be reorganized, and a friendly suit was decided upon as the quickest means of bringing this about. In the meantime, the Creditors' Committee has completed a tentative plan for establishing the company on a firm financial basis. This plan will probably call for the formation of a new company, to bid in

the property and assets of the failed company. Holders of the \$6,000,000 of 6 per cent. debenture bonds may be offered an exchange of preferred stock in the new company, while the shareholders may be allowed to subscribe to stock in the reorganized company. It is probable that two of the less valuable plants now in the combination will be disposed of, or "scrapped," while the other factories will concentrate on the manufacture of three or four models which it has been demonstrated can be made and sold at a profit.

The United States Motor Company came into existence in August, 1908, as the International Motor Company. The present name was adopted in December, 1909, when the Maxwell-Briscoe Motor Company, Columbia Motor Car Company, Brush Runabout Company, Alden Sampson Mfg. Company, Dayton Motor Car Company, Courier Car Company, Gray Motor Company, Briscoe Mfg. Company and Providence Engineering Works were taken in. Benjamin Briscoe was made president of the combination, which had an annual capacity of about 55,000 cars. This was increased still further by the absorption of the E. R. Thomas Motor Company a few months later.

The combination had an authorized capitalization of \$27,500,000 common and \$15,000,000 of 7 per cent. preferred stock, and \$12,500,000 of five-year convertible 6 per cent. debenture bonds. About half of the authorized securities have been issued, \$6,000,000 of the bonds having been underwritten by Eugene Meyer & Co. last year and offered to the public at 92. The preferred dividend was paid for a little more than one year. The failure of the combination is attributed by the bankers who have been going over its accounts to bad management.

The Creditors' Committee is composed of William H. Crosby, Crosby Company, Buffalo, N. Y.; W. Herbert Robinson, Pennsylvania Spring Works, Baldwinsville, N. Y.; G. L. Church, Brown & Sharpe Mfg. Company, Providence, R. I.; I. H. Smith, C. P. Howell & Co., New ark, N. J.; Benjamin S. Dean, Salisbury Wheel & Mfg. Company, Jamestown, N. Y., and Sidney S. Meyers, counsel, New York. The receivers are continuing production.

The Union Electric Light & Power Co., St. Louis, Mo., will on September 27 take a party of 150 manufacturers as its guests to Keokuk, Ia., to inspect the hydroelectric plant under construction at that point by the Mississippi River Power Company, and which will supply much of the power to be used in St. Louis.



New Foundry for Converter Steel Castings

One of the Complete Units of the
Plant of the Eagan-Rogers Steel &
Iron Company Near Philadelphia

A steel foundry of interesting design for making castings of small size by the converter and later by the electric furnace was recently completed by the Eagan-Rogers Steel & Iron Company at Crum Lynne, Pa., adjoining the city of Chester and about 12 miles from Philadelphia. It is the first unit of a plant which it is expected early to increase in size and therefore capacity and has now been in operation for nearly two months. It is located on a site of 5 acres of land, having a frontage of 550 ft. along the Philadelphia, Baltimore & Washington division of the Pennsylvania Railroad, directly adjacent to the Eddystone plant of the Baldwin Locomotive Works. The buildings now erected include the main foundry building and several adjacent supply buildings and an office building.

The foundry building is of structural steel frame with a corrugated steel covering and is 200 ft. long and 50 ft. wide, with a bay on one side, 30 ft. wide, extending the entire length. Provisions have been made for a 60-ft. ex-

tension at each end of the building. Plans are now being considered for the erection of several additions, including a machine shop and a power house, while a duplicate foundry building will be located parallel with the present building.

The entire main floor space of the foundry proper is used for molding purposes, benches being located at one side for snap flask work, while the heavier work is molded on the floor proper. A monitor surmounts the roof for the entire length of the building with 3 x 3-ft. pivoted sash, providing light and ventilation. A row of sash also extends the length of the building above the side bay, the windows being hinged at the sides and giving additional light to the foundry, while the bay itself is liberally supplied with windows of the sliding frame type. The window arrangements are, however, of a temporary nature as later on they are to be displaced by sash of the Detroit Fenestra type. The roof is of slag with 4-ply roofing



View of Section of Foundry for Bench Work, Showing Cupola at Right and Core and Mold Drying Ovens at Left.



View in the Cleaning Department.



View in the Pattern Shop.

felt laid on 2-in. yellow pine tongue and grooved planks.

The main foundry is served by a $7\frac{1}{2}$ -ton Alfred Box Co. electric traveling crane of 50 ft. span, operating on a runway 25 ft. above the floor level and extending the full length of the building. It is thus available for handling all classes of material, flasks, ladles, castings, etc., reaching any part of the main foundry and it can also serve the cupola floor, converter and other departments opening on the main foundry.

In the side bay which is 30 ft. wide, are located the pattern storage room, the core room, core ovens, grinding and tumbling departments, etc. A 2-ton electric crane is to be installed to serve almost the entire length of the bay. A pattern making department 30 x 40 ft. is temporarily located above the pattern storage department, and its equipment of wood and metal pattern-making machinery includes band saws, jointers, lathes, etc., operating from a motor-driven line shaft. The core room is supplied with an Obermayer cadet type oven for small cores, while the drying of large cores is done in a 20 x 12 x 10-ft. oven of the Rockwell Furnace Company manufacture. All ovens are gas fired. A second oven of the same make is to serve for the drying of molds. At the lower end of the bay is located the chipping department

and machinery for the sawing off of gates and risers on small castings, including hack and band saws, grinders, etc. Adjacent to the tumblers in the cleaning department are benches for hand cleaning of small castings. Heavy gates and risers are removed by the acetylene torch. A sandblast equipment is also provided for cleaning castings.

At the opposite side of the foundry are located sheds for the storage of sand, coke and other supplies. The sand grinding department opens directly on the main foundry floor at the upper end of the building. Cars are unloaded from a siding outside the building, from which sand is directly served to the mixer, the mill being of the self-dumping Thomas Carlin revolving pan type, 6 ft. in diameter, operated by an independent electric motor and delivering the mixed sand into steel buckets which are carried by crane to any part of the foundry.

The cupola department is located in a lean-to, 40 x 25 ft. in plan, located midway of the foundry and is designed to accommodate two 10-ton Whiting cupolas, having 56-in. shells. One has been installed. The charging platform is located 13 ft. above the level of the foundry floor and has a specially constructed charging floor composed of heavy plates laid on 5-in. I-beams, which are in turn carried by 20-in. steel beams. The charging floor has a weight sus-



Floor Molding Space, Showing Sand Grinding Type of Mixing Machine at Right End Corner



Blowers for Cupola and Converter.

taining capacity of 400 lb. per sq. ft. A Box 1-ton capacity electric traveling hoist, carried on an I-beam extending over the coke and pig iron supply yard, serves for raising materials to the charging floor.

Near the lean-to is located a Stoughton 2-ton side-blow steel converter, electrically operated from a pulpit located in the opposite bay. At a later date there is to be operated in connection with the converter an electric process for the further refining of the steel under patent rights controlled in the United States and Canada for what is known as the electro-Bessemer converter process, now in operation in England and Germany.

The blowers are located at the rear of the cupolas and converter. Wilbraham Green positive-pressure blowers are used. Independent blowers are provided for the cupolas and the converter, the former driven by a 25-hp. and the latter by a 75-hp. motor. In this department are also meters for measuring the current supplied the various departments, an arrangement which enables an accurate power cost for each department to be maintained. Westinghouse motors are used and the current is obtained from a power plant at Chester, Pa. The Rockwell system of oil burning torches is used for all heating and drying purposes except for ladles and converters, in connection with which the Houck system is used. A combined compressor and oil pump electrically driven as one unit is used for



(Converter Showing Motor Driven Control at Side.

maintaining the oil at a constant pressure and supplies all the various burners.

In laying out the plant, particular attention was given to the direct routing of the work to avoid any back tracking. Sand and crude materials enter at one end of the main foundry and are carried directly through in the various stages of operation to the opposite end, where are located the chipping and cleaning departments, scales for weighing and provisions for shipping the finished castings. An overhead trolley handles the heavier work. With the present equipment the plant has a capacity of 400 tons per month, making castings varying in weight from 1 lb. to 2 tons in weight. In addition to ordinary and specification steel castings, those composed of special alloy steel are being made.

The officers of the company are Daniel C. Eagan, president; John J. Buckley, vice-president; John I. Rogers, treasurer and sales manager, and M. A. Casey, secretary. Practically all of these gentlemen have been identified with the making of steel castings for a number of years.

Museum of Safety and Rathenau Medal

The Allgemeines Electricitäts-Gesellschaft, (A. E. G.) Berlin, Germany, has cabled President Arthur Williams of the American Museum of Safety that the Rathenau gold medal has been placed at the disposal of the museum for award annually for the best device or process for safeguarding life and limb or promoting health in the electrical industry. The competition is open to every country in the world, the only condition being that the device or process must be exhibited at the American Museum of Safety in New York City. This is the first time that the bestowal of a high European honor has been given to an American institution and indicates the standing of the American Museum among European scientists.

The Rathenau medal is well known in the European scientific world. It was presented to Dr. Emil Rathenau, who introduced incandescent lighting into Germany, and is president and founder of the Allgemeines Electricitäts-Gesellschaft, the greatest European electric company, on the occasion of his seventieth birthday, with the felicitations of the Kaiser for his services in the field of electro-technics. One medal will now be cast each year from the original die for the American Museum of Safety to award.

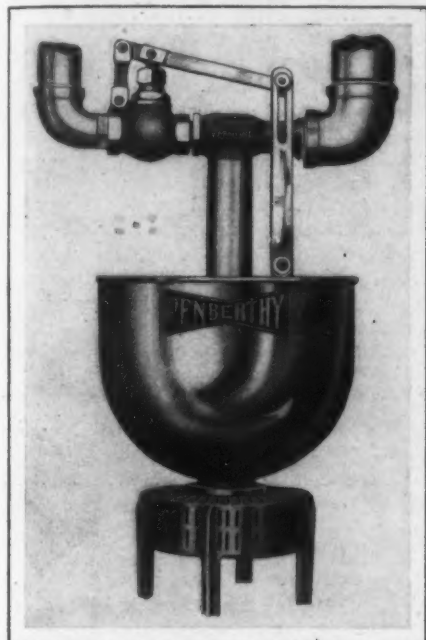
The Iron City Foundry Company, Lebanon, Pa., which began operations in that city about four years ago, has taken possession of its new plant at Third and Green streets, where it has erected a main foundry building, 65 x 80 ft., and other buildings for storage purposes. A Barry & Zecker cupola, having a capacity of seven tons per hour, has been installed, as has also all the general equipment in connection with the operation of the plant. The company was incorporated in 1908, and it is controlled by Harvey P. Daugherty, F. H. Lehman, G. Earle Daugherty and J. W. Reeber.

Galveston, Texas, it is interesting to note, is figuring to some extent in the exportation of iron and steel products. In the fiscal year 1911-12 its total exports of such commodities reached a value of \$513,007, against \$249,392 in the preceding year. The largest single article of export in 1911-12 was scrap iron and steel, the movement amounting to 20,490 tons, all of which went to Italy. Most of the other iron and steel exports went to Mexico, comprising machinery, pipes and fittings, wire, carwheels, hardware, cutlery, etc. The only rails exported went to Belgium, the shipment comprising 533 tons.

The American Smelting & Refining Company is reported to have decided to enlarge its smelting plant at Tacoma, Wash., not only for the purpose of handling a greater quantity of copper ore from Alaska, but also to enable it to reduce antimony ore which is also to be shipped from Alaska. It is stated that very large deposits of antimony have been developed in the Tanana Valley, Alaska.

Automatic Cellar Drainer

For use in pits, sumps, cellars, tanks, settling basins or wherever it is desired to keep water or other liquids from rising above a certain predetermined level, the Penberthy Injector Company, Detroit, Mich., has brought out an automatic cellar drainer. The device has been made very



A New Type of Automatic Cellar Drainer Made by the Penberthy Injector Company, Detroit, Mich.

compact, the float being made with a flat top and being also built around the suction pipe. Another feature claimed for this construction is that the exterior parts are prevented from being clogged up by deposits of slime, dirt or sediment.

The drainer is automatically operated by a float-controlled quick opening and closing valve, which is either entirely opened or closed, an arrangement which it is pointed out allows the ejector to operate at its maximum efficiency since it works at its full capacity. The float arms are slotted where they connect to the valve lever, an arrangement which prevents the ejector from operating until the water has raised the float to its highest point, and as the water is ejected the arms travel through the length of the slot before the weight of the float affects the valve. In this way the drainer operates for longer, but more infrequent periods, so that the water is discharged in considerable volume instead of a constant dribble, and at the same time wear is avoided.

The change in the shape of the float from a sphere to a flat-topped one, it is emphasized, has not affected its buoyancy and at the same time the space occupied is less than that for a round float of the same diameter. By building the float around the suction pipe, it has been made rigid, and the balance of the drainer is built directly above it. In this way the whole machine is kept in a small space and all the working parts, with the exception of the strainer and the float, are above water. This prevents the corrosion of the various parts or the clogging of the exterior ones, due to deposits of slime, dirt and sediment. A strainer which is so constructed that instead of the water being drawn directly upward it is taken in at the sides is used to prevent the interior parts from coming in contact with any foreign particles in the water. This enables the sediment to collect under the strainer, where it is not disturbed by the force of the suction. A foot valve is located inside the strainer which closes as soon as the drainer stops operating. In this way all the water is kept in the pipe and the drainer is primed ready for instantaneous starting as soon as the sump fills again.

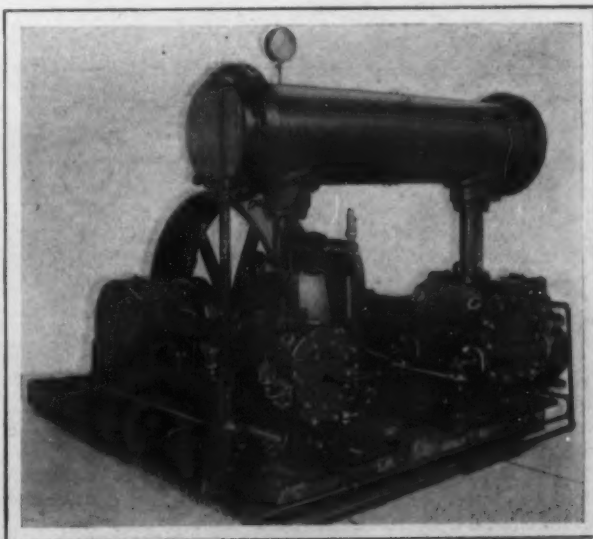
The Coal Products Mfg. Company, Lockport, Ill., near Joliet, began making coke September 9 in its new plant of 35 Koppers by-product ovens. The coke output will be sold by Hickman, Williams & Co., Chicago.

A New Type of Air Compressor

A new type of inclosed self-oiling belt-driven air compressor is being put on the market by the Chicago Pneumatic Tool Company, Chicago, Ill. This line is made in several sizes, the smallest of which was used to furnish compressed air for operating all the pneumatic apparatus at the machinery exhibit held in Atlantic City last June in connection with the conventions of the Master Car Builders' and American Railway Master Mechanics' associations and formed a part of the company's display. This compressor is known as the Chicago Pneumatic class M-CB and has two-stage air cylinders 16 and 10 in. in diameter respectively with a 12-in. stroke. The displacement at its rated speed of 210 r. p. m. is 576 cu. ft. of free air.

The inlet valves are of the semi-rotary Corliss type and are mechanically actuated by eccentrics on the compressor shaft, while the discharge valves are of the builder's standard air cushioned poppet type placed radially in the head. As these valves are interchangeable and are very accessible for adjustment and renewal, it is pointed out that this combination insures high volumetric efficiency and the elimination of valve trouble. The cylinder heads and walls are completely water jacketed and each has an independent water supply which permits solid gaskets to be used between the heads and the cylinders. The frames are of the full tangye type with bored cross-head guides which completely inclose the bearings. An iron casing incloses the cranks and eccentrics and provides complete flood lubrication of the bearings, cross-head and moving parts by automatic gravity lubrication. Lubrication of the inlet valves and pistons is secured by the use of large glass sight feed lubricators on the caps of the inlet valves and all the valve gear bearings have large compression grease cups. The air cylinders are bolted directly to the frames and extend down to the large sole plate with drip guards extending all around them. The cranks are of the balanced disk type and are pressed on the shaft and secured by keys. The intercooler is of the steel-shell marine condenser type and is mounted overhead. It has composition tubes, baffle plates and separator drip pockets.

The driving pulley is fastened to the shaft with split keys and is of an unusually heavy design to give a flywheel effect. The control is effected by an improved throttling



The New Type M-CB, Two-Stage Air Compressor Built by the Chicago Pneumatic Tool Company, Chicago, Ill.

intake controller operated by the pressure in the receiver. In this way it is possible to secure close regulation and the load is adjusted to meet the demand for air, thus it is emphasized, reducing the power consumption to a minimum. In the installation at Atlantic City, the compressor was driven by a Westinghouse type HF slip ring induction motor and a Cutler-Hammer controller having a diaphragm attachment arranged to shut down or start up the motor in accordance with the demand for air.

These compressors are built in sizes up to a maximum capacity of 4000 cu. ft. per min., and can be furnished either with motor drive with the motor mounted directly on the compressor shaft or with a short belt drive.

Chicago's Jobbing Steel Foundry

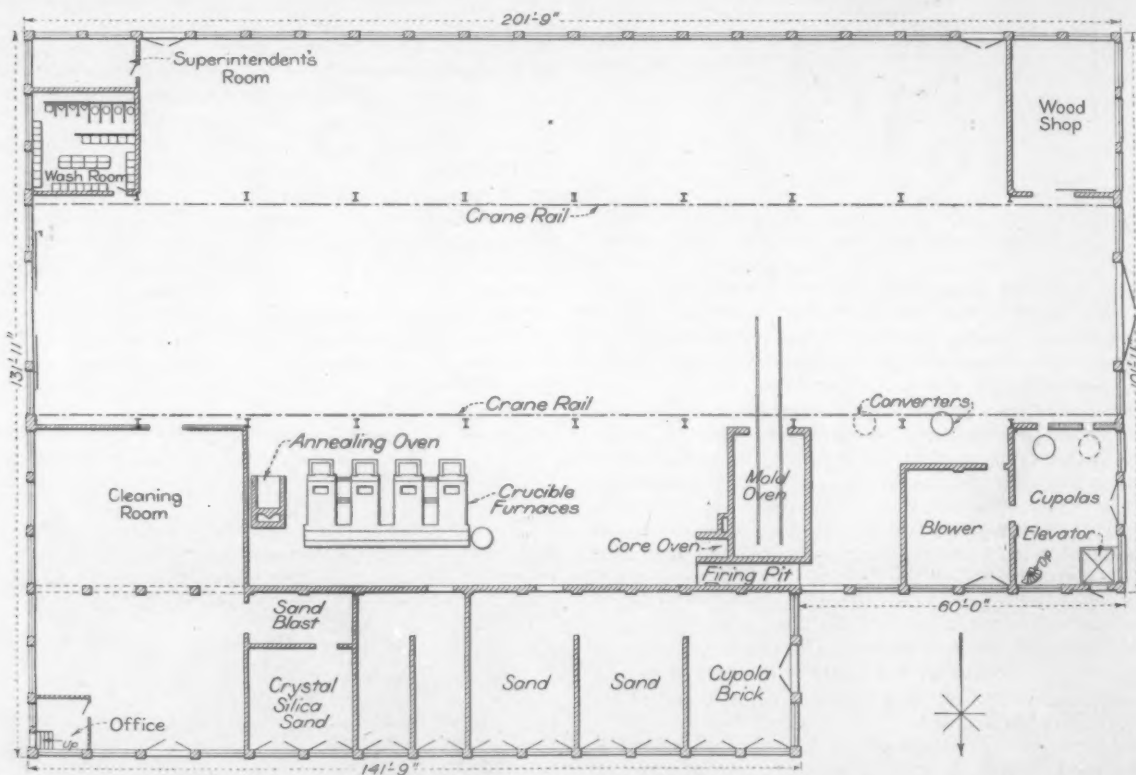
The New Plant of the Chicago Steel Foundry Company—Tropenas Converters and Crucible Furnaces—A Valuable Example in Arrangement and Equipment

On Friday, August 9, the Chicago Steel Foundry Company began moving its equipment from its former plant at Nineteenth and Rockwell streets, Chicago, and on the following Monday morning steel was being poured at the new plant at Kedzie avenue and Thirty-seventh street. The pioneer crucible steel foundry in Chicago at the time of its organization, in 1907, this company is now installed in a plant having a capacity of about 12 tons daily and with facilities suitable for the advantageous manufacture and handling of steel castings. The general character of the plant and the layout are indicated in the accompanying floor plan.

The main foundry building has a steel framework of standard design except for a special framing which provides for additional lighting sash along both sides of the

Sons Company, Philadelphia. Federal reinforced concrete tile is used for roof covering, the tile over the pattern storage being cast with inserted wire-glass lights. Both buildings are inclosed in brick.

The steel-making equipment of the foundry consists of a 1-ton Tropenas converter and cupola with provisions for the installation of a second unit, and four six-pot 3000-lb. oil burning crucible furnaces. The converter constitutes the primary steel making apparatus, while the crucible furnaces are installed as additional capacity and as auxiliary to the converter in the event of its being out of commission. As indicated in the plan, this equipment is confined to the side bay, leaving the main bay for a pouring floor for floor work and the opposite side bay as a pouring floor for the lighter bench work. For this bench molding



General Plan of the Main Building of the Chicago Steel Foundry Company.

main bay placed at a 45 deg. angle immediately below the bottom chord of the roof trusses. The main bay of the shop is 40 ft. wide and 200 ft. long, with a clearance below the truss chord of 26 ft. 6 in. and a height of crane rail above the floor of 20 ft. A 5-ton Whiting crane traverses this bay. A leanto bay on each side 30 ft. wide and 14 ft. in the clear under the trusses parallel the main bay, afford approximately 20,000 sq. ft. of foundry floor area. An additional wing 30 ft. wide and 140 ft. long on the north side of the building and immediately paralleling the railroad spur of the Chicago & Alton Railroad is suitably partitioned for the receiving of incoming raw material and the shipment of finished castings.

A second building, 25 ft. wide and paralleling the foundry, houses the offices, fireproof pattern storage and pattern shop. A large yard between the two buildings is used for flask storage. The stationary steel-frame sash in the sides of the main building and in the oblique roof lighting panels were furnished by the William Bailey Company, Springfield, Ohio, while the ventilating panels immediately under the roof on each side of the main bay are the Pond continuous type built by the David Lupton

the arrangement is such that the molders' work is directly in front of the windows with a south exposure. This affords exceptional light along the entire molding bench, which is built immediately against the wall of the foundry.

The cupola room is arranged for the installation of an elevator to the charging floor, an entrance being provided to the elevator from the yard, so that materials can be handled directly. For the present an elevator has been made unnecessary by the extension of a portion of the charging floor out under the crane in the main bay of the foundry. Charging materials can thus be elevated by the crane with all the necessary convenience. The hot metal is transferred by ladle from the cupola to the converter immediately alongside. The converter installation is standard in character with both motor-driven and hand-operated mechanism for tilting. The blower room immediately joins the cupola room. The blowing equipment consists of a No. 2 and a No. 3 high-pressure and low-pressure Roots blowers,

Aside from their size as six-pot furnaces, the crucible steel-making installation is not essentially unique except in that it is built on a concrete foundation with a con-



View in Side Bay Showing the Bench Work and Pouring Floor

crete outer wall tied in with iron binding and lined with firebrick. The annealing oven is of the company's own design, which is also true of the mold and core-drying ovens. These latter ovens, consisting of a large single-track car oven and small shelf core oven, are arranged with a common firing pit and flues.

The north wing of the building, as mentioned above, is divided by 6-inch hollow tile partitions into bins for sand and brick, so that they may be unloaded directly from the cars into the bins which are in turn directly accessible to the foundry floor. One portion of this wing is inclosed as a sand blast room, in which the sand blasting table is covered by a hood with induced draft to carry off the

dust of operation. The northeast corner of the building is equipped for the cleaning, finishing and shipping of castings. In the cleaning room two Sly tumbling barrels and two double-wheel No. 1 Champion grinders are installed. The grinders are hooded to carry off the dust. A George Whiting open-gap vertical shear with special blades is used for breaking off gates, and two No. 2 Marvel draw-cut saws serve a similar purpose.

While a greater portion of the castings in this foundry is cast in hand-made molds, equipment is installed for machine-made castings. The heavier work is made up on a Pridmore jarring machine, while for other work stripping plate machines are available. The unusual lighting



Main Foundry Bay Looking from the Cupola and Converter End. The Oblique Lighting Panels and the Upper Ventilating Sash Are Clearly Shown



The Crucible Furnaces at Close Range

of the foundry, resulting not only from the large south exposure, but also from the special lighting arrangement referred to above, which converges the light at the center of the molding floor, establishes conditions in the foundry especially favorable to the making of clean castings. For artificial lighting flaming arcs are used.

Flooring for Manufacturing Plants

Concrete Composition, Planking and Wood Block Types Compared

Choosing the proper flooring is one of the important problems in the building of new plants, and the question frequently comes up as one of the features of maintenance.

cheaply than any other of the types commonly used.

Wood planking, whether dressed and matched flooring or heavy timbers, is a comfortable floor upon which to work and in the case of heavy timbers in particular admits of anchoring machines very readily. It is more costly than concrete flooring, not only because of the timbers themselves, but by reason of the necessity for preparing a proper sub-flooring to prevent dry rotting of the timbers and to offer a proper support as well. Neither is the plank or board floor as durable as concrete, requiring replacement about one-third sooner. The depreciation of a timber flooring is very considerable from surface wear alone, due to the fact that the grain lies horizontal and the wood can be splintered. The repair of any particular spot in the floor ordinarily involves a considerable area, which is also true where changes in the flooring are desirable for the installation of new machinery foundations.

Wood block flooring, although more expensive than other types, costing approximately \$2.50 per sq. yd., is being used because it adds to the advantages of the ordinary timber or plank flooring a durability that makes the question of maintenance nearly negligible. Such flooring, placed in position with the grain vertical, as it always should be, is practically indestructible with ordinary wear and will not show ruts even in the portions of the floor where service is practically continuous or heavy. Wood blocks properly treated with creosote or other preparation will not absorb oil or other liquids and thus can be kept cleaner than a plank flooring. It has an advantage in the ease with which any portion of the floor may be taken up and replaced. The blocks themselves are made in 3, 3½ or 4-in. sizes; they are rectangular and the measurement is the depth along the grain. In literature about to be published, descriptive of wood block flooring, the Ayer & Lord Tie Company, Chicago, presents additional data concerning this type.



Cleaning and Finishing Room, Adjoining the Shipping Room

Motor-Driven 36-in. Lathe

Motor drive has recently been applied by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., to the Lodge & Shipley 36-in. standard pattern, triple geared, patent head engine lathe. This lathe is driven by a type S direct-current 15-hp. motor with a speed range of from 450 to 950 r.p.m. A distinguishing feature of the lathe is the use of a steel back gear quill instead of a cast-iron one which is the ordinary practice.

The lathe is a standard screw cutting engine lathe, having long spindle bearings which are finished straight and round by grinding. If these bearings should become damaged by fire or other accident, they can be replaced by a renewable white metal bearing. The use of double back gears permits the proper surface speeds on small diameter roughing cuts.

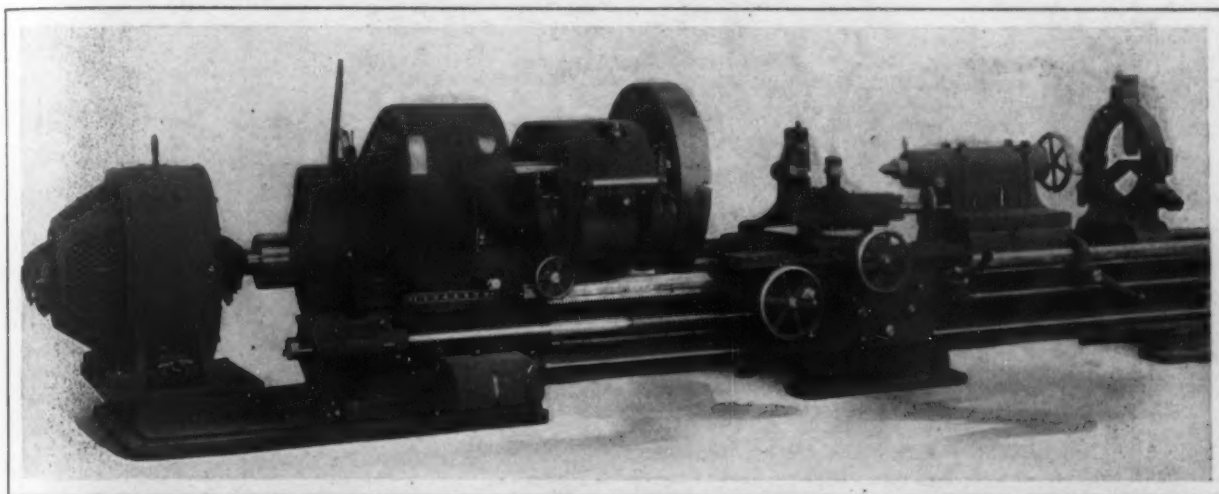
The ways of the lathe bed are built of chilled steel which it is emphasized materially increases the life of the lathe and also preserves the alignment of the tool. The bed is of such depth as to give great rigidity when heavy cuts are being taken. The lead screw is made of high-carbon ground stock and is chased in a special lathe to

controller is made by splined shafts and mitre gears, the former being located along the front of the lathe bed.

The following table gives the principal dimensions and specifications of the lathe:

Swing over shear, in.....	37
Swing over carriage, in.....	26
Distance between centers, 12-ft. bed, in.....	54 1/2
Travel of tailstock spindle, in.....	15 1/4
Diameter of tailstock spindle, in.....	4 1/4
Morse taper of spindle centers.....	No. 6
Diameter of front spindle and sleeve bearings, in.....	6
Length of front spindle bearing, in.....	10
Length of sleeve bearings, in.....	5 1/4
Diameter of rear spindle bearings, in.....	4 1/4
Length of rear spindle bearings, in.....	5 1/4
Diameter of hole through spindle, in.....	2 1/8
Diameter of spindle nose, in.....	5
Acme threads on spindle nose, per in.....	2
Ratio of first back gear.....	4 to 1
Ratio of second back gear.....	14.9 to 1
Number of thread and feed changes.....	40
Minimum number of threads cut per in.....	1/8
Maximum number of threads cut per in.....	14
Minimum feed per revolution of spindle, in.....	0.0143
Maximum feed per revolution of spindle, in.....	0.4
Number of speed changes.....	18
Minimum spindle speed, r. p. m.....	7
Maximum spindle speed, r. p. m.....	270
Domestic shipping weight, lb.....	15,150

The regular equipment furnished with the lathe consists of a six-speed friction countershaft, a thread indicator,



A 36-in. Standard Triple Geared Lathe Equipped with an Adjustable-Speed Motor Drive by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

insure accuracy within close limits. The bearing blocks for this screw are tongued and grooved into the bed and the threads of the screw are never in use except when cutting threads.

The bridge of the carriage has been considerably widened as compared with earlier machines and is very deep to resist spring under the cutting tool. The apron is tongued and grooved into the carriage as well as bolted to it. The feed is reversed at the apron. Drop forged quick change gears are used throughout and the apron gears are all steel, except the cross feed and lateral friction gears which are of high grade cast iron. All the feed and thread changes can be made while the lathe is running and there is an automatic lock-out at the apron to prevent the simultaneous engagement of the feed and the lead screw. All the gibs for the compound rest are tapered and are tongued into the groove of the slide.

The tailstock is clamped by four bolts operated from the top of the barrel. Additional clamping is secured by a pawl engaging in a rack in the bed. The tailstock spindle is of tool steel and is locked positively in position by a special locking device, which it is pointed out not only eliminates the split frame tailstock, but also preserves the alignment of the spindle.

As will be noticed from the engraving the motor driving this lathe is mounted at the end of the tool on an extension of the bed and is directly connected to the driving shaft. It is of the commutating pole adjustable-speed, direct-current type and the speed variation is obtained by a machine tool controller. The controller is mounted in a horizontal position on the bed plate of the lathe and the handle is located on the carriage just at the right of the operator's position, thus making it very convenient for him to handle. The connection between the handle and the

large and small face plates; compound, full swing, steady and follow rests and wrenches. A taper attachment, triple gearing, a turret on the carriage or shear, multiple stops for the longitudinal and cross feeds and connected compound and plain rests, etc., can be furnished at a slight extra cost.

Colorado Fuel & Iron Company Financing

A plan to readjust the capitalization of the Colorado Fuel & Iron Company, so that the 72 per cent. of back dividends on the \$2,000,000 preferred stock may be paid, is reported to be contemplated. It is believed that whatever is to be done will be decided upon before October 21, when the present charter of this company expires. It is said that the Colorado State authorities are anxious that the company should readjust its capital. The plan being considered, it is said, is an authorization of first and re-funding mortgage bonds of \$75,000,000, of which the first issue would be \$45,000,000. This would be sufficient to provide for all the existing bonds and those due later and for the growth of the business, and also for the retirement of the preferred stock, which, with accrued dividends, amounts to \$3,500,000. There is a belief among those interested that, should this be done, the most logical move for the company would be to make an offer of exchange of the new first mortgage bonds for the outstanding Colorado Industrial 5s. This would give the company but two classes of securities.

Wages for September and October in sheet and tin plate mills operated under the Amalgamated Association scale will be on the base of the scale, the average selling price of 14 x 20 coke plates in July and August not entitling the men to an advance.

Coupler Shearing and Riveting Press

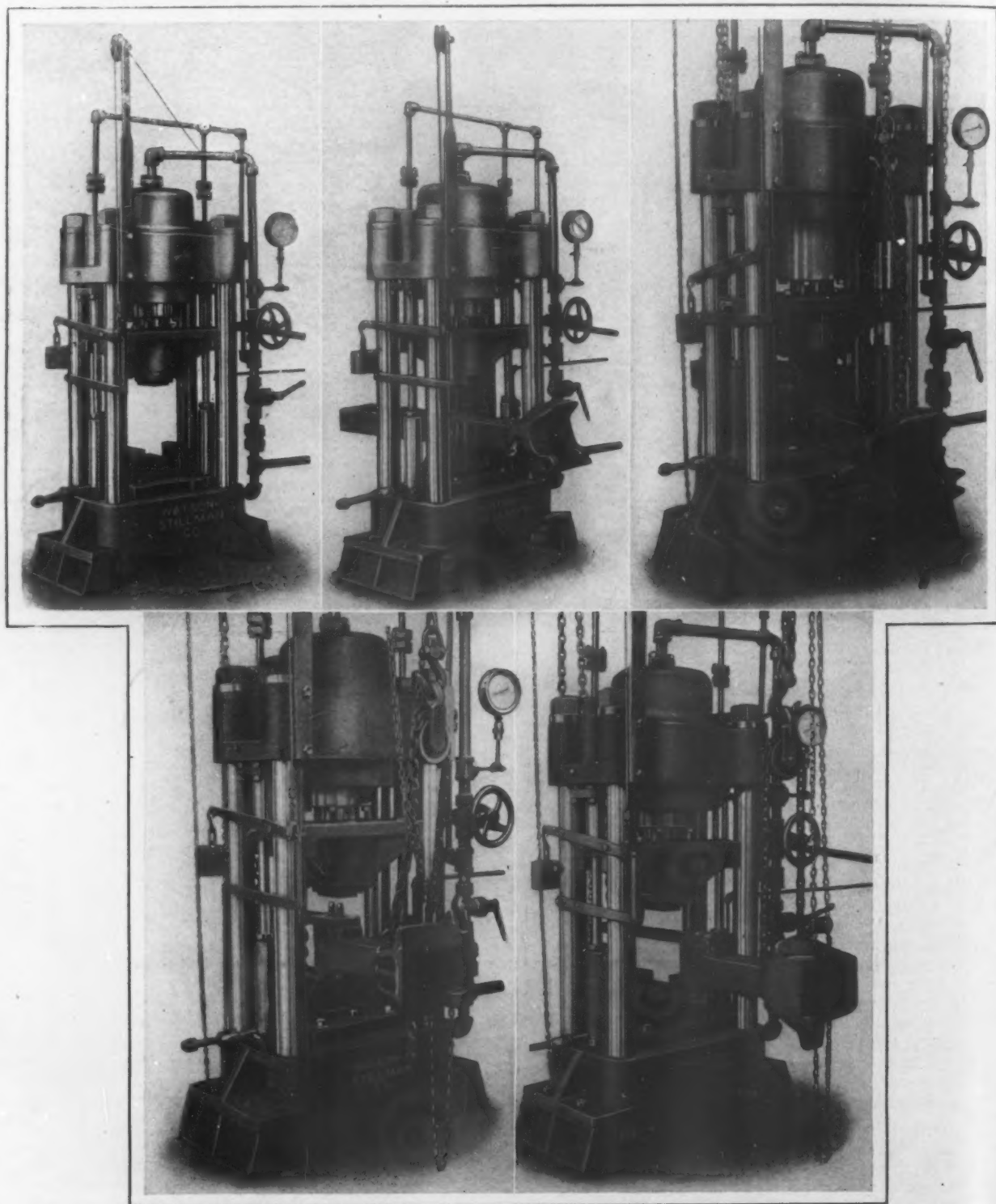
A New Watson-Stillman Product Using Hydraulic Power

For shearing riveted coupler yokes from their couplers or clamping and riveting the couplers and yokes together the Watson-Stillman Company, 190 Fulton street, New York City, has designed and built a new hydraulic press. Either operation is effected at a single stroke of the ram and the use of hydraulic power, it is pointed out, tends to effect economy and a saving in labor over the common practice of doing this work by hand. It is also possible for the man operating the press to spend much of his time helping to handle the couplers and yokes.

The press is built with heavily ribbed platens. These platens have ample room for placing and removing the work and there are two push back rams for returning

the large ram automatically together with the necessary gauge and valves in full view and easy control of the operator. It will handle standard coupler shanks and yokes up to 5 x 7 in. and rivets up to 1 1/4 in. in diameter, the action of the press being clearly brought out in the accompanying engraving.

Referring to the accompanying engraving, the shearing operation is illustrated by the three views in the upper portion of the cut. In the one at the left the press is in position to receive the coupler and the ram is up with the shearing and riveting blocks in place. In the middle engraving the press is in the act of shearing the coupler from its yoke, which rests upon supporting blocks that are cleared by the coupler shank. The ram descends upon the shank, forces it downward and shears both ends of the rivets with one movement, the yoke being left upon the block. The position of the coupler and yoke after the shearing operation is completed is shown at the right



Successive Stages in the Operation of a New Car Coupler Shearing and Riveting Press Built by the Watson-Stillman Company, New York City.

and the method for handling the separated parts is also indicated.

The two remaining views illustrate the riveting operation, the one at the left showing the coupler with the yoke and rivets attached and everything in readiness for the heading of the rivets. The main ram and the smaller clamping ram start downward simultaneously, the latter first clamping the yoke to the coupler shank. The riveting die attached to the large ram then descends upon the rivets and heads them. The remaining engraving illustrates the position of the various parts of the machine after the riveting operation is completed. Here the ram has been returned and the coupler and yokes partially withdrawn from the press.

The following table gives the principal dimensions and specifications of the press:

Space between tension rods, in.....	24 $\frac{1}{4}$ x9 $\frac{1}{4}$
Diameter of main ram, in.....	12
Stroke of main ram, in.....	6
Diameter of clamping rams, in.....	3
Stroke of clamping rams, in.....	6 $\frac{1}{2}$
Diameter of push back rams, in.....	1 $\frac{1}{4}$
Capacity of press, tons.....	200
Over-all height, in.....	80
Floor space required, in.....	22x51
Weight, lb.....	7,858

High-Speed Metal Cutting Machine

The Racine Tool & Machine Company, Racine Junction, Wis., has recently brought out a high speed metal cutting machine, equipped with a three-speed attachment. The

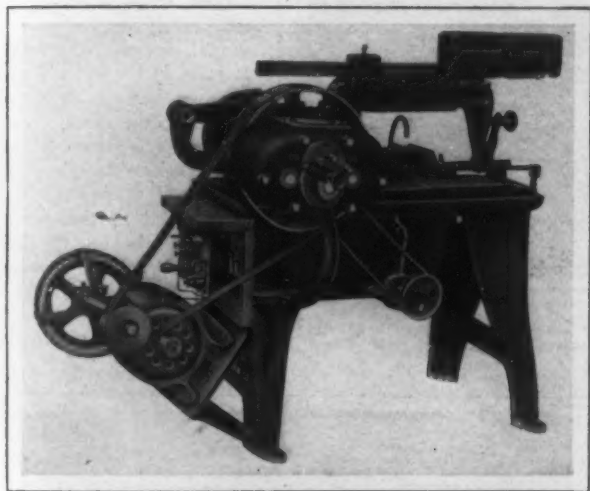


Fig. 1—The No. 5 High-Speed Metal Cutting Machine Built by the Racine Tool & Machine Company, Racine Junction, Wis.

attachment is designed to give speeds of 60, 90 and 125 r. p. m., for cutting unannealed tool steel, annealed high speed steel and mild steel, respectively. Fig. 1 is a view of the No. 5 high-speed metal cutting machine equipped

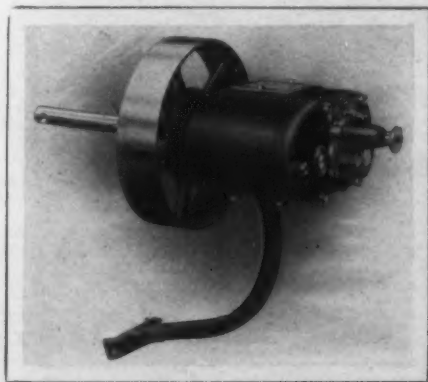


Fig. 2—The Three-Speed Attachment Supplied for the Machine

with the three-speed attachment, while Fig. 2 is a view of the attachment itself.

The general construction of the machine is the same as that now generally recognized as standard for this class of machinery and the equipment includes an automatic

lifting device, a cooling system, automatic height regulation of the saw frame and blade holders. The automatic lifting device causes the blade to be raised clear of the work on the return stroke. This does away with any dragging on the non-cutting stroke, and it is pointed out that the output and endurance of the blade is thus increased 500 per cent. While the blade is in use a cutting compound is applied to it by a geared circulating pump. The saw frame will hold itself automatically at any height, which is a convenient arrangement when placing stock in the machine. The blade holders used are made from a 1 x $\frac{3}{4}$ in. flat bar fitted into a milled slot. The function of this arrangement is to keep the blade square with the work and thus insure a straight cut, while the blade tightener enables the operator to give the blade sufficient tension without using a wrench.

The following table gives the principal dimensions and specifications of the machine:

Maximum size of stock handled, in.....	6
Minimum length of blade, in.....	10
Maximum length of blade, in.....	14
Diameter of driving pulley, in.....	12
Face width of driving pulley, in.....	2 $\frac{1}{2}$
Over-all height, in.....	39
Height to top of table, in.....	26
Floor space, in.....	33x55
Net weight, lb.....	565
Crated shipping weight, lb.....	625

In use this machine has cut bars of machinery steel 6 in. thick in 20 min.

The three-speed attachment shown in Fig. 2 provides the necessary range of speeds for cutting mild or soft steel, annealed high speed steel and unannealed tool steel, the limits being 125 and 60 r. p. m. This attachment is of the geared type and the changes are secured by varying the position of the plunger in front of the attachment. The design of this attachment is such that it is said not to be possible to strip or injure the gears and it is possible to attach the transmission to a machine in 5 min.

Wheeling Mold & Foundry Improvements

The Wheeling Mold & Foundry Company, Wheeling, W. Va., builder of rolling mill equipment, is spending about \$40,000 in improvements. A heavy crane runway is being erected over the pig iron yard and charging floor. The columns of this runway will be extended about 15 ft. above the crane rails and it will be roofed over. A cement floor will be laid in the yard thus roofed and the space secured will be used for storing patterns. A 160-ft. addition to the present erecting shop is to be built for use as a roll shop, and all the roll lathes will be moved into this new department. The present runway over the flask and storage yards will be extended to run through the present cleaning shop. This storage yard runway was completed this summer, and it is also roofed over. The horsepower in the power plant has recently been increased from 600 to 1000, this being made necessary by the installation of new machine shop equipment and two 30-ton electric cranes built by the Alliance Machine Company, Alliance, Ohio, which were added early in the year.

The starting of the Hall blast furnace of the Republic Iron & Steel Company means that the company is now operating 100 per cent. of capacity, the highest rate of output since the improvement in the steel trade began. It is now turning out at the rate of considerably more than 1,000,000 tons of pig iron a year and a far larger production of all classes of steel products than at any time since the company was organized.

The Kansas Public Utilities Commission has been notified by the Kansas Natural Gas Company that all manufacturing plants now using natural gas for fuel must change to either coal or oil September 20, the plan being to husband the supply for domestic use. The company has also asked permission to raise its price from 30c. and 35c. to 50c. per 1000 ft. for domestic purposes to still further conserve the supply.

The Colorado Fuel & Iron Company states that the report is incorrect that it is spending \$2,500,000 in doubling the capacity of its open-hearth steel plant. No furnaces are now being built.

Large German Planing Machine Quick Adjustment By an Independent Motor a Special Feature of This Schiess Tool

A large planing machine possessing a number of interesting features was recently sold by the Wiener Machinery Company, 50 Church street, New York City, to the Mesta Machine Company, Pittsburgh, Pa. This tool was built by Ernst Schiess, Ltd., Düsseldorf, Germany, for whom

comparing the height of the man standing by it with that of the machine. The planing length is 33 ft., and pieces measuring 157 in. wide and 138 in. high can be accommodated. There are two tool holders at each standard and all four are arranged for automatic setting. This adjustment enables the holders to be set in a horizontal, vertical or inclined position up to a maximum of 45 deg., and they also have a quick-acting power arrangement which enables them to be moved at the rate of about 2 ft. per min. and the tools are automatically lifted when the table is being

run back. The cross rails can be lowered or raised at the rate of 10 in. per min., and all of these changes can be made independently of the main drive by a 12-hp. motor arranged as shown on the top of the machine. This motor is readily accessible from a specially arranged bridge and is operated in different ways from a switch on the right side of the machine, a detail of the driving mechanism being shown in Fig. 4.

The table, which is 126 in. wide, is arranged to permit an easy removal of the shavings. It runs in three wide flat grooves having an automatic oiling system and is driven by two broad steel racks through a 50-hp. reversible motor. The speed of the motor is such that a planing speed of 56 in. is secured and a backward speed of 12 ft.

The machine was built

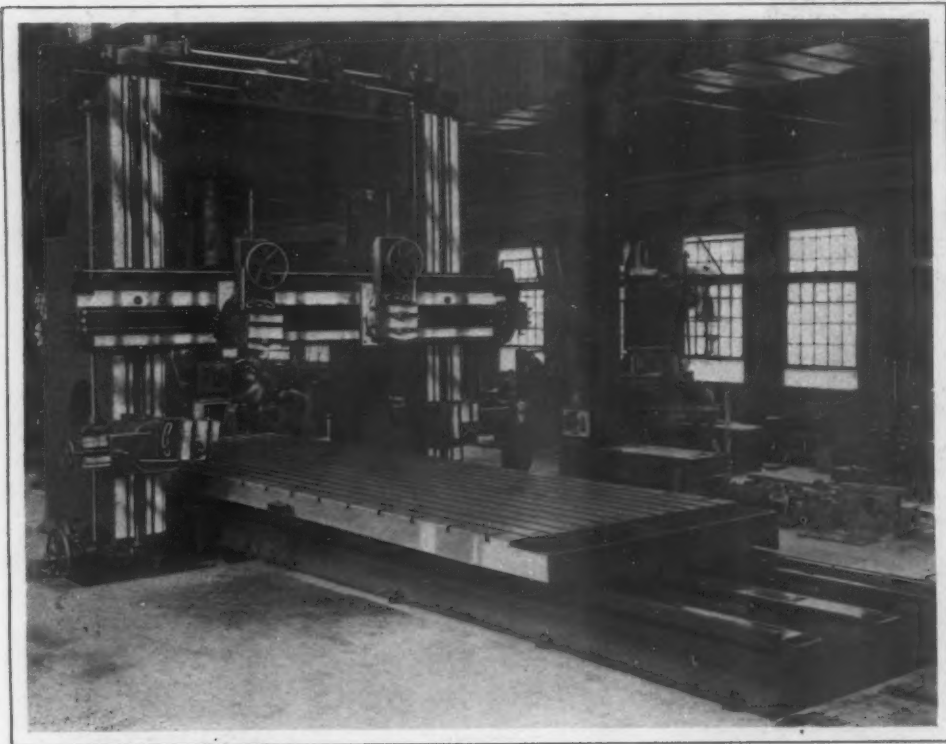


Fig. 1—A Large German Planing Machine Imported and Sold to the Mesta Machine Company by the Wiener Machinery Company, New York City

the Wiener Machinery Company is the American representative. Several views of the machine are reproduced herewith, Fig. 1 being a view of the operating side. Figs. 2 and 3 are rear and front views, showing respectively the massiveness of the housings and the arrangement of the tool holders and the cross rail. A detail of the driving mechanism is shown in Fig. 4.

Some idea of the size of the machine may be gained by

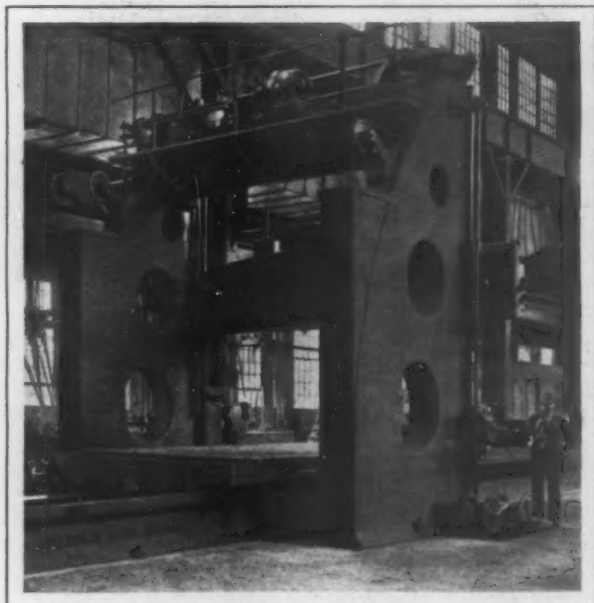


Fig. 2—Rear View of the Machine Showing the Massiveness of the Housings



Fig. 3—Front View of the Machine

to accommodate pieces up to a maximum weight of 110,000 lb., and the normal tool pressure is about 25,000



Fig. 4—Detail of the Driving Mechanism

lb. Its complete weight, exclusive of the Westinghouse driving motor, is approximately 300,000 lb.

Cleveland Crane Business

The Cleveland Crane & Engineering Company, Wickliffe, Ohio, reports the receipt recently of the following: Orders for four large cranes for the Cambria Steel Company, 35-ton ladle crane for the Illinois Steel Company, three 68-ft. span cranes for the Blaw Steel Centering Company, a 110-ft. steel traveling crane for the Central Tube Company, two 20-ton 4-motor cranes for the Vandergrift plant of the American Sheet & Tin Plate Company, a 40-ton gantry crane for the Pennsylvania Railroad Company in Cleveland, five cranes for the Crucible Steel Company of America, a special gantry long span double cantilever crane for the Martin Cantine Company, Saugerties, N. Y., five 4-motor traveling cranes for the General Electric Company, and two cranes and a transfer table for the Northern Ohio Power & Light Company, Akron. Recent shipments include a special crane and runway for the city of Pittsburgh, a 30-ton 4-motor and a 20-ton 3-motor long span crane to the Wm. Cramp & Sons Ship & Engine Building Company, and two wall cranes to the Buckeye Steel Casting Company, Columbus, Ohio. The company has also recently made several crane shipments to Canada, among them being a 20-ton double trolley crane for the Canadian Locomotive Works, Kingston, Ont.; three cranes for the new steel foundry of the Dominion Steel Castings Company, Hamilton, Ont., and two 4-motor cranes to the Algoma Steel Company, Sault Ste. Marie, Ont.

The Robinson Mfg. Company, Cleveland, Ohio, has moved from its old quarters at 1711 Harvard avenue to a new plant at 8123-8125 Brunner avenue, housed in a brick structure, 30 x 75 ft., one story. The company makes a specialty of pipe hangers and pipe straps. It also manufactures beam clamps, lag screws and bolts, suspension bars, steel hook and ring plates, ceiling plates, etc.

F. F. Harmon, proprietor of the Cleveland Metal Treating Company, has purchased the business of the Cleveland Welding & Brazing Company, 5371 St. Clair avenue, Cleveland, Ohio, and will conduct it at the same address for the present. J. M. Fitzpatrick, former owner, will remove shortly to El Paso, Texas, where he will engage in the welding and brazing business.

Knock-Down Steel Barrel

Durability, availability for refilling and economy of space in shipping are the special features claimed for a new steel slack barrel which has been recently placed on the market by the Inland Steel Company, Chicago, Ill. The barrel is the counterpart in capacity and shape of the ordinary wooden barrel. Two styles are made, both of which are the same size, but in one the heads are tight and in the other they are removable. The cost of the barrel compares favorably with that of a wooden one and the ease with which the barrel may be knocked down makes this the natural manner of shipment, so that where it is desirable to return the barrels to the original shipper for refilling, the economy of space is such as to make this possible. Fig. 1 shows the body of the barrel as it is formed and before the heads are put on, while Fig. 2 illustrates a complete container.

The body of the barrel is rolled and corrugated in one operation from No. 28 gauge cold rolled sheet steel, the corrugations being broader and shallower at the center of the roll and deeper and narrower at the edges. The sheet is formed with a larger diameter in the middle which produces the ordinary barrel contour. The heads are finished in three operations on the ordinary mechanical press. In the first one the outer flange of the head is drawn down and the concentric reinforcing circles are formed. The second operation consists in turning over the edge of the flange preparatory to forming the locking feature of the tight heads, and the third operation consists of clinching the turned-over edge of the flange for reinforcing. This clinching operation leaves portions of the turned-over edge projecting in such a manner as to engage projections stamped out of the body sheet as indicated in Fig. 1. In this way when the head is pressed down it remains permanently locked until pried loose with such force as to considerably mutilate the head. Where the barrels are made with removable heads, only the first forming operation is necessary, after which slots are punched in the flange cor-

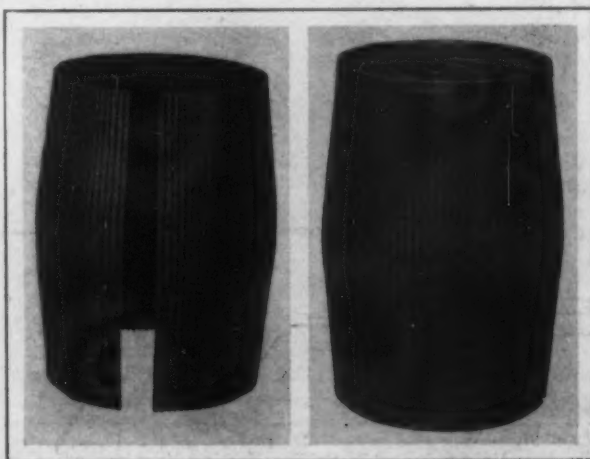


Fig. 1—The Shell of the Barrel Fig. 2—The Finished Barrel Two Views of a Steel Slack Barrel Made by the Inland Steel Company, Chicago, Ill.

responding to similar ones in the rim of the barrel body. The head can thus be temporarily secured by the insertion of a piece of hoop steel or wire through these slots, while the manner of uniting the ends of the shell longitudinally is easily apparent from Fig. 1.

The weight of the barrels is 11 lb. each, and the initial capacity of the plant is 20,000 barrels per day.

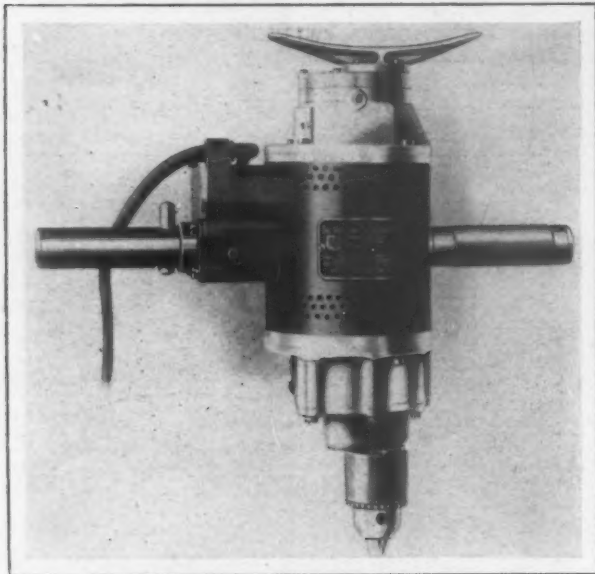
The Decatur Bridge Company, Decatur, Ill., has been awarded the contract for the construction of the main building of the new car shops at Decatur for the Wabash Railroad. It will be 1118 ft. long and 160 ft. wide and will have a capacity for repairing 50 locomotives per month. Its equipment will include 12 electric cranes, two of them of 75-ton lifting power, and it will have three tracks to accommodate the largest locomotives. The mechanical equipment, lists for which are being prepared, will involve the expenditure of about \$400,000 more. The plant is expected to be in operation early in the coming year.

A New Electric Drilling Machine

As an addition to its line of Hard Service electrically-operated drilling and reaming machines, which were described in *The Iron Age*, July 20, 1911, the Van Dorn & Dutton Company, Cleveland, Ohio, has just brought out a new universal machine of larger capacity but similar in general mechanical features to the line that was placed on the market by this company about a year ago. That line included two types of universal machine with a drilling capacity of $\frac{1}{4}$ and $\frac{3}{8}$ in. in steel and a reaming capacity of 3-16 and 5-16 in. The new tool, which is known as type D A-1 machine has a drilling capacity of $\frac{1}{2}$ in. in steel and 1 in. in wood and a reaming capacity of 7-16 in. The machine is 14 in. high from the top of the handle to the end of the chuck and weighs 17 lb. Its speed is 700 r.p.m. It is furnished for either 110 or 220 volts.

The universal electric drilling machines have the advantage over either the direct or the alternating current machines in that they can be operated on either a direct or alternating current with equal effectiveness. As compared with the alternating-current machines they are considerably lighter and can be operated at any frequency ranging from 20 to 133 cycles. The straight alternating-current motor must be wound for a particular frequency, and the ready adaptability of the universal tool to many conditions is thus apparent.

The new tool, like the others of the Hard Service line made by this company, is built along machine tool lines and is designed to meet the requirements of that class of trade which wants tools for long and continued service. In constructing the machine it has been the aim of the maker to use the materials best adapted to the functions to



The New Universal Electric Drilling Machine Manufactured by the Van Dorn & Dutton Company, Cleveland, Ohio

be performed and with the highest grade of workmanship to produce tools that are simple in construction, durable, reliable in operation and as light as is consistent with the power developed.

Series motors of the stator type are used in the construction of the universal tool. The armature is of the slotted drum type and is built of special analysis soft steel laminations on a solid shaft, each disk being uniformly insulated. The stator frames are constructed of sheet steel. Interior parts and connections are easily accessible by removing the screws that hold the gear case to the motor housing. The commutator is readily accessible for surfacing or cleaning, all that is required being the removal of a cap secured by two screws. This cap is entirely separate from the opening provided for the insertion or adjustment of brushes.

The method of lubrication is simple and effective. A case which incloses the gears serves both as a housing and as a lubricant chamber for the gears, the spindle and the thrust bearing. The bearings are lubricated by channels running from this case, the motion of the gears forcing the lubricant through the passages. Ordinary

machine oil is used for lubricating the spindle, the wipe system being employed for this part. Imported ball bearings are used for the high speed members and Elephant bronze bushings are used as bearings for the slower speed members. All gears are made from alloy steel and are hardened and ground to size to secure strength and long-wearing qualities. The spindle and socket are made of a special grade of steel which is hardened and ground. A $\frac{1}{2}$ -in. chuck will be furnished in place of a socket when desired. The tool has a fan of special design with sufficient capacity to keep the motor cool.

Double-Spindle Lathe Improvements

Recent improvements made in the 2-in-1 double-spindle lathe by J. J. McCabe, 30 Church street, New York City, have adapted it for use in street railway repair shops for

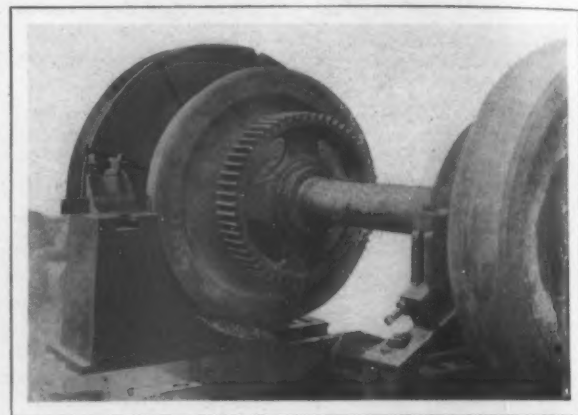


Fig. 1—The Solid Block Tool Rest Employed in the New 2-in-1 Double-Spindle Lathe for Turning Carwheels Built by J. J. McCabe, New York City

the turning of car wheels. Fig. 1 is a view of the lathe and Fig. 2 shows the car wheel attachment.

As will be noticed from Fig. 1, which shows a 26-48-in. swing double-spindle lathe, the tool rest is a single heavy block of rigid, powerful construction. It is pointed out that the work of turning down old steel M. C. B. wheels which have numerous hard spots is about as severe a test as any lathe can be put to, and the tool rest was designed especially to withstand the severe duty imposed upon the tool in doing this work. When wheels of this type are being turned an internal geared face plate, having a ratio of 72 to 1, is employed so that the power which the tool possesses for handling heavy work is apparent.

The wheel turning attachment which is shown in Fig. 2 was especially designed as a result of the builder's experience in having furnished his lathe to a number of street railways in all parts of the world. It is intended to hold

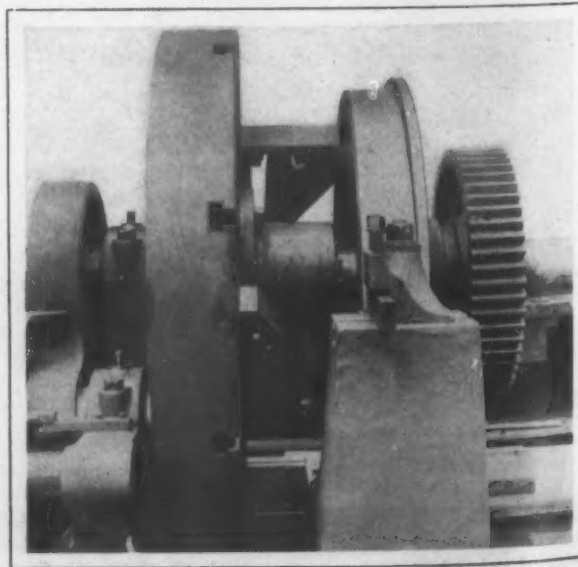


Fig. 2—View Showing the Manner of Driving the Wheel

steel wheels when mounted on the axle with the gear either on or off and consists of one socket plate that fits a recess in the geared face plate, two driving arms and one set of

split bushings for holding one size of axle or journal. In operation the driving arms are slipped into slots in the face plate and between the spokes of the wheel.

New Iron and Steel Works Construction

Projects and Contracts Announced Since the Beginning of This Year

In the issue of January 4 an attempt was made to give some idea of new iron and steel works construction to be undertaken for the current year. At that time the steel trade was suffering from extremely low prices and the outlook was decidedly discouraging for the erection of new iron and steel plants or the extension of old ones. Consequently the forecast of new construction for the year was very much under that shown at the beginning of several preceding years.

It was not long after the opening of the year, however, until it was seen that such pressure was being thrown on steel plants particularly that additional producing capacity could easily be utilized. This brought about projects for new steel plants and new propositions for the enlargement of old ones. The sheet and tin plate industries also seem to have presented inviting opportunities for expansion.

We have gone over our files for the current year and present below, in chronological order, announcements made regarding new iron and steel works construction which collectively show rather surprising activity in this direction, running far beyond anything anticipated at the beginning of the year. The announcements are especially interesting with regard to the construction of open-hearth steel furnaces. Roughly, not less than 2,000,000 tons of steel-making capacity is in process of addition at this time. It may be said that some of the new steel-making projects announced late last year, or at the beginning of this year, have not taken shape; that is, no contracts have been announced for them. These projects are not given in the statement presented below. It may also be said that some of the blast furnace projects which are here mentioned have not yet gone so far as to reach the actual contracting or construction stage.

January 11.—Atlanta, Ga. Atlanta Steel Company. To build another 50-ton open-hearth furnace and a continuous billet mill.

January 11.—Brackenridge, Pa. West Penn Steel Company. To build three more hot sheet mills.

February 1.—Sand Springs, Okla. Pioneer Iron & Steel Company. To build a bar mill.

February 1.—Chester, Pa. Eagan-Rogers Steel & Iron Company. To build a steel casting plant, an electric furnace to be part of the equipment.

February 8.—Chester, Pa. Keystone Steel Casting Company. Adding one 4-ton open-hearth furnace.

February 8.—Youngstown, Ohio. Brier Hill Steel Company. To build seven 75-ton open-hearth furnaces.

February 15.—Buffalo, N. Y. W. P. Taylor & Co. To install 2 1/2-ton Stock converter to manufacture steel castings.

February 22.—Follansbee, W. Va. Follansbee Steel Company. To build another 30-ton open-hearth furnace and a 2-high reversing bar mill.

February 22.—Portland, Ore. Columbia Iron & Steel Company. To build a blast furnace.

March 14.—East Chicago, Ind. Inland Steel Company. To build four 60-ton open-hearth furnaces.

March 21.—Easton, Pa. Treadwell Engineering Company. Installed a 2-ton electric furnace for steel castings.

April 4.—Duluth, Minn. Minnesota Steel Company. Contracts placed for two 500-ton blast furnaces.

May 2.—Warren, Ohio. Trumbull Steel Company. To build eight tinplate mills.

May 2.—Morgantown, W. Va. Pittsburgh Sheet & Tin Plate Company. To build six sheet mills and four tin mills.

May 9.—Weirton, W. Va. Phillips Sheet & Tin Plate Company. To build a blast furnace and a steel plant.

May 9.—Washington, D. C. Standard Sheet Steel Company. To build a sheet mill plant.

May 9.—Sharon, Pa. National Malleable Castings Company. To build a Héroult electric furnace.

May 9.—Apollo, Pa. Apollo Steel Company. To build a six-mill sheet plant.

May 16.—Hammond, Ind. Ferdinand Schlesinger and associates. To build blast furnaces and a steel plant.

May 23.—Youngstown, Ohio. Youngstown Sheet & Tube Company. To build a fourth blast furnace.

June 6.—Braddock, Pa. Carnegie Steel Company. To build 14 60-ton open-hearth furnaces at its Edgar Thomson Works.

June 13.—Niles, Ohio. Deforest Sheet & Tin Plate Company. Adding five finishing mills.

June 13.—Johnstown, Pa. Cambria Steel Company. To build three 75-ton open-hearth furnaces.

June 13.—Youngstown, Ohio. Republic Iron & Steel Company. To build four merchant bar mills to replace old ones.

June 20.—East Chicago, Ind. Inland Steel Company. To build a 90-in. plate mill.

June 20.—Youngstown, Ohio. Youngstown Sheet & Tube Company. To build one mill for rolling black plates for tinning.

June 27.—Steubenville, Ohio. La Belle Iron Works. Considering a 50-ton open-hearth furnace, four more sheet mills and two more jobbing mills.

June 27.—Midland, Pa. Pittsburgh Crucible Steel Company. Will build eight 60-ton open-hearth furnaces instead of six as at first announced.

July 4.—Canal Dover, Ohio. Reeves Mfg. Company. Has its new sheet plant in operation—six mills.

July 18.—Port Bolivar, Texas.—Wesley Merritt and associates. To build a blast furnace.

July 18.—Vandergrift, Pa. Blanket appropriation made for additional open-hearth capacity at the Apollo works of the American Sheet & Tin Plate Company for two, four or six furnaces.

August 8.—Wheeling, W. Va. Wheeling Sheet & Tin Plate Company. To build a 10-mill tin plate plant.

August 15.—Massillon, Ohio. Massillon Rolling Mill Company. To add another hot sheet mill, making 10.

August 15.—Monessen, Pa. Pittsburgh Steel Company. To add two bar mills.

August 15.—Steel City, near Houston, Texas. Southwestern Steel Corporation. To build blast furnaces and a steel plant.

August 15.—South Bethlehem, Pa. Bethlehem Steel Company. To add a Girod electric furnace.

August 22.—South Bethlehem, Pa. Bethlehem Steel Company. To build six 75-ton open-hearth furnaces.

August 22.—Washington, Pa. Washington Tin Plate Company. To add one tin mill, making six.

August 22.—Perth Amboy, N. J. C. Pardee Works. To add a 20-in. bar mill.

August 22.—Duluth, Minn. Minnesota Steel Company. Contracts placed for a 40-in. blooming mill, a 28-in. rail or finishing mill, a 28-in. roughing mill and a 16-in. continuous mill.

August 22.—Buffalo, N. Y. Lackawanna Steel Company. Completing two 100-ton open-hearth furnaces.

August 29.—Pittsburgh, Cal. Columbia Steel Company. Adding a 2-ton converter (side-blown).

August 29.—Lorain, Ohio. National Tube Company. To add three 80-ton open-hearth furnaces.

September 12.—Clairton, Pa. Clairton Steel Company. To build two 60-ton open-hearth furnaces.

September 12.—Syracuse, N. Y. Crucible Steel Company of America. To build a tool steel plant twice the capacity of its Sanderson Works.

September 12.—Harrison, N. J. Crucible Steel Company. Building a Héroult electric furnace at its Atha Works.

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W. H. Taylor - President and Treasurer
I. A. Mekeel - First Vice-President
Fritz J. Frank - Secretary
M. C. Robbins - General Manager

Editors

Geo. W. Cope A. I. Findley W. W. Macon

Charles S. Baur - Advertising Manager

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The Foundrymen's Convention

In recognition of the important gathering of foundrymen at Buffalo next week, this issue of *The Iron Age* devotes large space to foundry topics, though without the omission of any of the regular features of the paper. The foundrymen's associations have been a great force in the foundry betterment movement of the past 15 years. Sometimes they have threshed over old straw and at times there may have been ground for the criticism that in the literary outturn quantity was secured at the expense of quality. But when one compares conditions as they are, as to foundry management and processes, with what they were before the campaign of education began, he can at least say that the advance has been as marked as in any other department of the great metal working industry.

Foundry metallurgy and foundry mechanics have made great strides. Representing the latter field, the exhibits of machinery at the annual conventions of the American Foundrymen's Association have been for several years a feature of great attractiveness. They have brought many hundreds of proprietors, superintendents and foremen to the meetings and have made the expositions a veritable exchange, where negotiations for equipment have often been begun and in a good many cases concluded. As of interest to those who will go to Buffalo to acquaint themselves with the improvements in foundry equipment, some of which have been developed since the Pittsburgh convention of May, 1911, a schedule of next week's exhibits is given on other pages.

Not in five years has such a convention been held when foundrymen were busier or when the outlook for their trade gave such promise.

Railroad Steel Requirements

A period has been reached in which the steel requirements of railroads are to be judged by their gross earnings, rather than their net, if the earnings basis is to be taken at all as an index. This, perhaps, is not the common idea; and if it is not, the misconception is attributable to the propaganda in recent years of the railroads and their friends the supply and equipment interests. When a general movement was made, late in the spring of 1910, to advance railroad rates, the plea was made that it was necessary, for the proper maintenance of railroad property and its due expansion to take care of prospective needs, that the credit of the railroads should be preserved by the assurance of large profits. As it became more uncertain that general rate advances would be allowed, the propaganda along this line became more and more highly colored, until the criticism became justified that the railroads themselves were injuring their credit.

There has thus been created a large measure of sentiment that railroad expenditures in iron and steel depend upon new financing. The fact has largely been lost sight of, that the ordinary upkeep of railroad property involves a large quantity of iron and steel, and that such upkeep obviously cannot be predicated upon increased borrowings. The security of railroad bonds and stocks should rest neither upon the exercise of ability continually to increase the total face value, nor upon large temporary payments of interest and dividends. It should rest rather upon a strengthening of the physical properties represented. Without attempt-

ing to pass final judgment, there is reason to believe that too much is now known about railroad accounting to pay large dividends at the expense of the property. Further than this, however, the surveillance of the Interstate Commerce Commission is now quite complete, the effort being made, and presumably with success, to require railroads fully to maintain their properties before paying a return upon their securities outstanding.

As the density of traffic increases, the cost of railroading naturally involves a larger and larger proportion of maintenance and operating expense, and a less proportion, per unit of business done, of return upon capital invested. The ton of freight moved needs to pay less to the capital invested, while the investment wears out more rapidly.

The iron and steel trade, in casting up its prospects for business, thus needs to look more to the item of the amount of railroad traffic, and less to the status of railroad credit. It is less a question of how large dividends the railroads can pay, and much more a question of how rapidly they are wearing out their property in conducting transportation.

Current railroad earnings should be studied in this light. The latest monthly bulletin of the Interstate Commerce Commission covers the month of May and the 11 months ended with May, practically representing a fiscal year. While more than three months have elapsed, and while partial returns of railroad operations are available for later months, the report of the commission is the only one which permits of this detailed study. Observing only the showing for the 11-month periods, and regarding the returns as representative of the full fiscal years, we have a representation for the past three fiscal years of all roads with an annual gross revenue of more than \$1,000,000, reduced to a basis per mile of road.

Comparing the fiscal years 1910 and 1911, the total operating revenue increased slightly in the latter, while the operating expense increased very largely, resulting in a large decrease in net operating revenue. In the next fiscal year, the one just closed, the operating revenue increased almost infinitesimally, the operating expenses increased slightly, and the net revenue decreased slightly.

The total operating revenue per mile of line has thus successively increased, but only slightly. This represents roughly the volume of traffic, per mile of line, so that since the length of railroad has steadily increased the total railroad traffic of the country has very materially increased.

The increase in operating expenses has been on a much larger scale. From 1910 to 1911 it was almost wholly in transportation expenses, the increase being produced chiefly, no doubt, by the general wage advances. For the next fiscal year, the one just ended, there was only a slight further increase in transportation expenses.

The two items which chiefly concern the iron and steel trade, maintenance of way and structures and maintenance of equipment respectively, have shown a curious divergence. Comparing 1910 with 1911, and then 1911 with 1912, there was a progressive decrease in maintenance of way and structures, and a progressive increase in maintenance of equipment. This maintenance of equipment was not, of course, measured by actual expenditure but by the amounts set aside. The question is whether the amounts were expended.

There is reason to believe that they were not. If the funds are not actually available for purchases of equipment, they will have to be made available.

A few figures may perhaps be of interest. In the 11 months ended last May the total operating revenue from rail operations, per mile of line, was \$11,532, which was an increase of \$9. The operating expenses were \$7,976, an increase of \$74, and the net operating revenue was therefore \$3,556, a decrease of \$65. The increase of \$74 in operating expenses was made up of an increase of \$61 in transportation expenses, largely wages, an increase of \$43 in maintenance of equipment, and a decrease of \$32 in maintenance of way and structures, with a couple of very minor items.

According to the figures, the stress of increased wages is largely passed. Without further advances, railroad earnings will no longer tend to show a decrease on this account. Maintenance of equipment, on the other hand, shows a constantly increasing tendency. This increase represents increased allowances on the books, and the actual funds must be found and expended eventually, irrespective of other considerations.

Some Machinery Export Essentials

Before American manufacturers began to reach out after export business the shipping clerk's position was insignificant. The office porter, if he was handy with the marking brush, often filled the place, and as long as shipments were confined to domestic points he had little trouble in satisfying his employers. It was only after numerous annoying experiences that manufacturers realized that the position was of genuine importance, requiring the services of a man of no small amount of intelligence, and a large number are now patterning after European houses by employing men who know how to make a shipment to any country on the globe.

The first duty of an export shipping clerk is to see that all shipments are packed properly, so that a reasonable amount of rough handling will not injure the merchandise. In packing machinery he is careful to have all exposed bearings that might be injured by rust covered with white lead or some equally good coating. In this connection it might be stated that a Western machinery firm has found that a mixture of white lead and common black grease will keep bearings free from rust almost indefinitely. In one instance a machine tool that was being sent abroad by this firm fell overboard at the port of shipment, but when brought to the surface, over a week afterward, it was found that the salt water had not injured any part of it.

The expert shipping clerk is also particular to address all packages plainly, putting on each the gross, net and tare weights, as well as the cubic measurement. In making shipments to the interior of a country like Mexico, he is also particularly careful to mark and consign the shipment in care of the custom house agent at the port of entry designated by the purchaser; in the absence of any instructions of this kind from the customer, the custom house agent of the foreign railroad taking the shipment to destination is notified, so that there will be no delay in clearing the goods. When a machine is shipped knocked down, each piece is numbered and the number and weight of the particular piece are shown on both the consular and customer's invoices.

While the points above elucidated may seem super-

fluous to firms having forwarding agents at New York or other exporting points, these same forwarding agents, as well as the interior manufacturers, would be saved much trouble and expense in having their shipments sent out properly boxed, addressed and invoiced.

Increasing the Scope of Special Equipment

In almost every large metal-working plant and many smaller ones machines have been provided of a more or less special character which are used intermittently for certain service and stand idle the remainder of the time. In probably the great majority of instances this condition is accepted by the management as a matter of course, much the same as the presence of carriage horses in a stable when their use is not required.

With good management, however, such tools can frequently be kept in continuous service and made to yield additional revenue as a sort of by-product to the regular work of the plant. This is because many other firms have work which can be done to advantage with special tools of the same character, but either do not have enough of it to justify putting in the extra equipment or are debarred from doing so by the initial expense. Some of these concerns find means of doing the work with other apparatus which may be principally used for an altogether different purpose and has been designed accordingly; but this is seldom economical, and where special facilities can be offered them for the work at reasonable rates, the benefit is mutual. In some localities, within recent years, this idea has been quite largely worked out, and it would pay others engaged in the metal-working industries to inquire into its possibilities as affecting their own conditions.

An important consideration is that the interchange of the improved facilities afforded by special tools and the consequent increase in their earning capacity, reduction or elimination of stand-by losses, etc., result in their much wider use and create a more extensive market for them. All this, in turn, is bound to exercise a stimulating influence on the tool market, and its tendency is to lower production costs for all classes of material affected.

Publicity for Equipment Needs

The advantages to buyers of shop and factory equipment, of giving wide publicity to their requirements when they are increasing their manufacturing facilities, has been pointed out from time to time. When business is good and deliveries slow the benefits of advertising to the trade just what is needed are sharply accentuated. We have seen again the beginning of such a period. Already prompt shipments of certain types of machinery are hard to obtain, and the condition is becoming more general.

The buyer who seeks to avoid what he terms the annoyances of a flood of letters and literature coming, as a consequence of publicity, from manufacturers of the equipment he is buying, narrows his selection, and at the same time casts aside the chance of hastening the installation which will give him the desired increased production. Whatever trouble and labor may ensue can easily be disposed of by turning the mail matter and the reception of salesmen to some one person—say an engineer or the purchasing agent. He can

sift the chaff from the wheat. In many cases information thus obtained has included the discovery of machinery or appliances much better suited to the purpose than would otherwise have been chosen. Many houses have found it valuable to preserve and index all literature having to do with their equipment. No better way can be found for obtaining it than by a statement of requirements in a publication such as *The Iron Age*, which is looked to for the information because an editorial department specializes on accurate news of this character. It pays to reach the house that sells as well as the house that buys.

Vandergrift—A Model Town

The town of Vandergrift, Pa., where the largest sheet mill plant of the American Sheet & Tin Plate Company is located, has been the subject of many magazine and newspaper articles. There is probably not another town in the world that has as many unique features as Vandergrift. Much of the original planning of the town was done by George G. McMurtry, then president of the Apollo Iron & Steel Company, which company laid out the town, when establishing its works. The company was afterward taken over by the American Sheet Steel Company which was then merged with the American Tin Plate Company, forming the present American Sheet & Tin Plate Company.

Vandergrift boasts of more beautiful homes occupied by employees of the American Sheet & Tin Plate Company than any other workingman's town in the world. The skilled men earn large incomes and take pride in beautifying their homes within and without. In a recent issue of *Leslie's Weekly*, Edward M. Thierry had an article on Vandergrift, in part as follows:

"In point of fact, there is not a single saloon in Vandergrift, Pa.; indeed, there is none within five miles of the spot. It is an industrial town, yet the liquor adjunct, so highly capitalized by those whose mission it is to criticize, never has been considered necessary to the peace and prosperity of Vandergrift. The town gives the lie to detractors, who have declared that liquor is the 'saving grace'—perhaps the necessary antidote—of the 'slaving toil that breaks men down at 40' in the steel mills.

"These men of Vandergrift do not simply exist there—they live. It is no working camp; it's a home community. The employees of the great American Sheet & Tin Plate works are 90 per cent. American. They own their own homes, too. In fact, it is a question if 20 per cent. of the houses in Vandergrift are rented.

"More than that, the men live well. The word 'luxury' has no meaning there, for they have sought and gained the things so classed. So one of the things that impresses the stranger—the great number of automobiles owned by the workers—is not surprising to them. It is a matter of course. About 3400 men are employed in the plant, and the Vandergrift Automobile Club has more than 150 members."

Stimulating the Interest of Employees

The Diamond Forging & Mfg. Company, N. S., Pittsburgh, manufacturer of automobile, wagon and tool forgings, recognizes the fact that the good will of its employees is a valuable asset, and that they are in a position to note many changes that might be made in its goods, that would tend not only to increase their quality, but also to reduce their cost. Each month it offers all the men in its tubular steel whiffletree department a cash prize for the best improvement in a certain style of whiffletree that is selected by G. Wickersham. The company manufactures over 200 different styles of such whiffletrees. The company says that the effect produced by this offer is remarkable. The men take more pride in their work, produce a larger quantity in a turn than heretofore and there is a good-natured rivalry among them for the prize. The company has fully recovered from the effects of the fire that destroyed its entire plant last February and is at present operating day and night. It says that the political situation has not affected the drop forging business.

Testing Materials Congress Tourists in Buffalo

The participants in the official tour following the International Congress for Testing Materials, arrived in Buffalo Friday morning to the number of 270. They were met at the railroad station by the local reception committee of which C. L. Johnson, vice-president Corrugated Bar Company, was chairman, and were escorted to the Statler Hotel for breakfast. Shortly after 9.30 a. m. the visitors were taken to the Pierce automobile plant in the new near-side trolley cars which provided for a view of the residential section of Buffalo. At the Pierce plant they were assembled in the large dining hall, which will seat 1500, and were personally conducted through the most interesting parts of the plant in groups of 15 to 20. The many automatic machines and the well equipped chemical, physical and metallographic laboratories attracted attention. The electric welding machines, including a spot welder, also proved interesting.

About 11 a. m. the visitors were taken in automobiles to the plant of the Larkin Company where the chemical and research laboratories were admired. After lunch at the Larkin plant they boarded the steamer United Shores for a trip through the harbor to the plant of the Lackawanna Steel Company. The plant was reached about 4 p. m., where they boarded a special observation train. Many of the party, especially the Germans, had visited the plant in 1904 and expressed surprise at the advance made in the eight years. Owing to the lack of time nobody left the train, which went slowly past the blast furnaces and the ship canal to the coke ovens. Thence the party passed by the rail mill, the plate and other mills and the open hearth plant where the two new furnaces were pointed out. They re-embarked about 5 o'clock and were taken through the lower harbor into the lake and down the Niagara River to Black Rock Harbor where the boat steamed through the new Government lock around which much of the Lackawanna steel sheet piling used in the coffer-dam could still be seen. A special train at the Black Rock station took the tourists to Niagara Falls.

Large Order for Railroad Scales

The Norfolk & Western Railroad has given R. W. Romig of the Fairbanks Company, Pittsburgh, what is said to be the largest order for scales ever placed by any railroad in the United States or abroad. It consists of 11 railroad track scales of 200 tons capacity each and 8 of 150 tons each. The order was influenced by the satisfactory operation of two Fairbanks suspension pit pattern track scales installed about two years ago at its East Portsmouth, Ohio, yards. Other railroads that have adopted the same type of scales are the Pittsburgh & Lake Erie, Baltimore & Ohio, New York Central, Birmingham & Southern and the Erie.

Puddlers employed in the bar iron mills in the Central West that operate under the Amalgamated scale will receive \$6 for puddling for September and October, against \$5.85 in July and August. Heaters will receive 59½ cents per ton, against 58.9 cents in July and August, and rollers will receive 39.6 cents per ton, against 39.2 cents per ton for July and August.

The Republic Iron & Steel Company, Youngstown, Ohio, has decided to dismantle its Tudor works at East St. Louis, Ill. The plant consists of two puddle mills; 8, 10, 12 and 16-in. finishing mills; a bolt factory and a railroad spike factory. With the elimination of the Tudor works, the Republic will have but one iron mill, the Inland works at East Chicago, Ind., and the company approaches closer to an all-steel basis, which is its ultimate object.

The Mesta Machine Company, Pittsburgh, has opened a branch office in room 1238 Real Estate Trust Company Building, Philadelphia, Pa., in charge of Herman E. Beyer, for several years the Pittsburgh representative of the Southwark Foundry & Machine Company of Philadelphia. Mr. Beyer, who is a graduate of Cornell University, has been connected with the Southwark Company continuously since leaving college.

The Marion Steam Shovel Company, Marion, Ohio, is the lowest bidder for furnishing a new dredge for Milwaukee harbor, \$47,750. The award has not yet been made.

Co-operative Safety Congress in Milwaukee

Parallel Meetings with the Association of Iron and Steel Electrical Engineers

What is to be called the first co-operative safety congress will be held at the Hotel Pfister, Milwaukee, Wis., September 30 to October 5, under the auspices of the Association of Iron and Steel Electrical Engineers. The programme provides for a number of meetings to discuss safety matters and a number of sessions simultaneous with these to take up miscellaneous papers which have been collected for the annual meeting of the Association of Iron and Steel Electrical Engineers, which held its last meeting a year ago in New York City. An exhibit of safety appliances is expected and C. W. Price, Wisconsin Industrial Commission, has been appointed director.

The week's discussions will open with an annual safety dinner, Monday evening, September 30. Among the speakers will be Dr. Charles Neill, Commissioner of Labor, Washington, D. C.; James A. Emery, counsel National Association of Manufacturers, and Mr. Campbell, Chicago, attorney for the Illinois Steel Company. The sessions on safety are as follows:

October 1, 10 a. m., Federal Session, with papers by Dr. Joseph A. Holmes on safety in mines, by Dr. Lucien W. Chaney, of the Bureau of Labor, on the advantages of a co-operative safety society and by C. C. McCord, of the Interstate Commerce Commission, on safety as standardized by the Commission.

October 1, 2 p. m., States Session, of which W. F. Houk, Commissioner of Labor, Michigan, will be chairman.

October 2, 10 a. m., Mines Session, with papers, among others, by Thomas Lynch, president H. C. Frick Coke Company, by W. J. Mather, Cleveland-Cliffs Iron Company on safety measures in iron mines, and by Vice-President Crockard Tennessee Coal, Iron & Railroad Company, on a similar subject.

October 2, 2 p. m., Transportation Session, with papers, among others, by W. H. Belknap, chief inspector of safety appliances, Interstate Commerce Commission, and by George Bradshaw, general safety agent, The New York Central Lines, on accident prevention in railroad shops and round houses.

October 3, 10 a. m., Manufacturers' Session, John Kirby, Jr., president National Association of Manufacturers, chairman.

October 3, 2 p. m., Allied Associations' Session, F. C. Schwedtmann, president Citizens Industrial Association, chairman.

October 4, 10 a. m., Iron and Steel Session.
For sessions of the Association of Iron and Steel Electrical Engineers are announced the following papers:

Blast Furnace Tops, by A. C. Handy.
Mixed Pressure Turbines, by E. D. Dickinson.
Automatic Speed Regulators, by E. J. Cheney.
Proper Use of the Compound Field, by R. B. Treat.
The Use of A. C. Versus D. C. Motors for Crane Service, by M. A. Whiting.
Arc Welding, by J. F. Lincoln.
Spot and Butt Welding, by F. Warren.
Industrial Lighting, by Ward Harrison.
Lighting Calculations, by C. J. Mundo.
Industrial Lighting, by C. E. Ciewell.
Types of Windings of Electrical Machines, by H. C. Specht.
Effect of Temperature on the Insulation of Dynamic Machinery, by C. E. Skinner.
Fiber Conduit, by Mr. Atcheson.
Underground Cables, by Charles R. Sturtevant.
Tubular Poles, by W. T. Snyder.
Reinforced Concrete Poles, by R. A. Cummings.
Structural Steel Poles, by R. Fleming.
Underground Electrical Conduit Construction, illustrated by lantern slides, by W. W. Grant.
Dynamic Braking, by R. B. Davenport.
Hoist Limits, by E. H. Wentz.
Roll Train Drive, by Wilfred Sykes.

Proposals will be received by the city of Wheeling, W. Va., until 9 a. m., September 26, for the erection and equipment of a pumping station. The equipment will include two high pressure motor-driven triplex pumps, with capacity of 200,000 gal. each daily; two steel tanks of 50,000 gal. capacity each, with 200 tons of pipe and valves; fittings and fire hydrants. J. Richard Kommer, 1116 House building, Pittsburgh, is consulting engineer.

The Iron and Metal Markets

Buying for 1913 Under Way The Basis 1.35c. for Bars and 1.40c. for Plates and Shapes

Further Pig Iron Advances—Higher Prices for Export than for Domestic Rails

Iron and steel markets continue exceedingly strong, with good sized advances in pig iron in some districts, and in finished material a rising tendency, but less talk of a runaway market.

The opening of the books of important steel companies for deliveries in 1913 is the chief new development of the week. Sales of steel bars have been made for the first quarter at 1.35c. Pittsburgh, and of plates and structural shapes at 1.40c. Sellers are careful to say that these transactions are largely with buyers who needed to know the basis of steel cost in pending contracts for their own products; also that the preference of steel manufacturers is to defer for a little the entering of any considerable orders for next year.

The inability of the large producers to take further business for 1912 delivery in the chief products of steel has been shown more plainly in the past week by further advances of \$1 to \$2 a ton on material from store. Yet it is distinctly a feature of the situation that no such scarcity of any form of steel has developed as to send buyers hurrying into the market to make doubly sure of getting steel they will not need for five or six months hence.

At the same time railroads are being urged to be early with their orders for open hearth rails for spring delivery, and already there are good bookings for winter rollings. The B. & O. and Pennsylvania orders, which will be large, are likely to be closed within ten days. The Lackawanna railroad is reported to have placed 20,000 tons, the greater part at Buffalo. The Harriman lines have bought 10,000 tons more for this year at Chicago. The Southern Pacific has just added 18,000 tons to its 1912 order, and the Great Northern is negotiating for additional rails.

Export business in all lines is at full tide, and for export rails higher prices are being secured than for home deliveries—the second period in the history of our steel exports in which this has been the case. Following a 12,000-ton contract for Siam captured by American mills, the Canton & Hankow railroad has bought 5000 tons here. The single Chinese rail mill is sold up for 12 months.

An order for 2500 cars for Argentina has been taken by the Middletown, Pa., works. New domestic contracts include 3000 for the Buffalo, Rochester & Pittsburgh, 2500 steel underframes for the Northern Pacific and 500 steel hopper cars for the Wabash. The new Canadian plant of the National Car Company has orders from the Canadian Northern and Canadian Pacific that will keep it busy to the end of 1913.

The congestion of Central Western and Chicago plate mills is still such as to allow Eastern mills to get a steady business for early delivery at the highest prices in years. One Eastern seller has now advanced to 1.50c. at mill for sheared and 1.55c. for universal plates.

On structural steel 1.40c. Pittsburgh now appears

to be minimum, and while contracts for buildings and bridges have not been as large in September as in August, a large volume of work is ahead. The steel for the Equitable Building, New York, 36,000 tons, was placed this week.

Some tin plate contracts have been made for 1913 at \$3.60, Pittsburgh, but some of the largest producers are still holding off on forward business.

Spikes have been advanced to \$1.80, Pittsburgh, under liberal buying. Hoops and bands are also higher and another advance in shafting is likely.

The week's advances in foundry pig iron represent an average of about 50 cents in Northern markets. In some sections, particularly the East, buying is less, but the pace was getting rapid and a breathing spell is not amiss. Western and Central Western buying of foundry grades for the first quarter and first half of 1913 is still considerable and the situation is stronger in every quarter.

Further sales of 4000 tons of Southern iron have been made for export to Italy in the early months of 1913, the price netting \$14 at furnace for No. 3. Southern No. 2 iron has sold at \$13.50 Birmingham, for delivery in the first quarter, and \$13 is minimum with Alabama sellers for this year.

Inquiry for 10,000 tons of basic iron for southern Ohio and for 5000 tons for Chicago has come up in the Central West. The report that 40,000 tons will be bought for Youngstown is denied. Two sales of 2000 tons of Bessemer iron have been made at \$15.50 Valley for the first four months of next year.

Speculation and legitimate demand have made an excited market in British pig iron and prices are soaring. Cleveland warrants reached 67s. 11d. on Tuesday and much higher is predicted. No such level has been seen in the British market since 1900. Advices from both Great Britain and Germany indicate a boom situation, with prospects of heavy demand for many months. Our British letter refers to the possibility that deliveries may not be made on semi-finished steel bought there from American companies not yet committed to the policy of definitely setting aside a certain tonnage for the export trade.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type.
Declines in Italics.

At date, one week, one month and one year previous.

Sept. 18, Sept. 11, Aug. 21, Sept. 20,

Pig Iron,	Per Gross Ton:	1912.	1912.	1912.	1911.
Foundry No. 2, standard, Philadelphia	\$16.75	\$16.50	\$16.00	\$15.00
Foundry No. 2, Valley furnace	14.50	14.25	14.00	13.50
Foundry No. 2, Southern, Cincinnati	16.00	15.75	15.00	13.25
Foundry No. 2, Birmingham, Ala.	12.75	12.50	11.75	10.00
Foundry No. 2, at furnace, Chicago*	16.50	15.50	15.50	14.50
Basic, delivered, eastern Pa.	16.00	16.50	16.00	14.75
Basic, Valley furnace	14.25	14.25	14.00	12.60
Bessemer, Pittsburgh	15.90	15.90	15.40	15.90
Malleable Bessemer, Chicago	17.00	15.50	15.50	14.50
Gray forge, Pittsburgh	14.65	14.65	14.40	13.90
Lake Superior charcoal, Chicago	17.75	16.75	16.25	16.50
Billets, etc. Per Gross Ton:					
Bessemer billets, Pittsburgh	24.00	23.50	22.50	21.00
Open hearth billets, Pittsburgh	24.50	24.00	23.00	21.00
Forging billets, Pittsburgh	32.00	32.00	29.00	26.00
Open hearth billets, Philadelphia	27.00	25.90	25.40	22.40
Wire rods, Pittsburgh	27.00	27.00	26.00	27.00
Old Material, Per Gross Ton:					
Iron rails, Chicago	17.00	16.50	16.00	14.50
Iron rails, Philadelphia	17.00	17.00	16.50	17.00
Car wheels, Chicago	14.50	14.25	14.00	12.75
Car wheels, Philadelphia	14.25	14.25	14.00	12.50
Heavy steel scrap, Pittsburgh	14.25	14.00	13.75	12.75
Heavy steel scrap, Chicago	12.75	12.25	12.00	10.50
Heavy steel scrap, Philadelphia	14.50	14.50	14.00	12.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel,	Sept. 18, Sept. 11, Aug. 21, Sept. 20,			
	1912.	1912.	1912.	1911.
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.42½	1.42½	1.37½	1.22½
Iron bars, Pittsburgh.....	1.45	1.50	1.40	1.25
Iron bars, Chicago.....	1.45	1.45	1.40	1.22½
Steel bars, Pittsburgh.....	1.35	1.30	1.30	1.20
Steel bars, tidewater, New York	1.51	1.46	1.46	1.36
Tank plates, Pittsburgh.....	1.40	1.40	1.35	1.30
Tank plates, tidewater, New York	1.56	1.56	1.51	1.46
Beams, Pittsburgh.....	1.40	1.35	1.35	1.35
Beams, tidewater, New York...	1.56	1.56	1.51	1.51
Angles, Pittsburgh.....	1.40	1.35	1.35	1.35
Angles, tidewater, New York...	1.56	1.56	1.51	1.51
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.25	1.20
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.30	1.30

Sheets, Nails and Wire,

Per Pound to Largest Buyers:	Cents.			
	1912.	1912.	1912.	1911.
Sheets, black, No. 28, Pittsburgh	2.10	2.05	2.05	1.90
Wire nails, Pittsburgh.....	1.70	1.70	1.65	1.65
Cut nails, Pittsburgh.....	1.60	1.60	1.60	1.55
Fence wire, ann'led, 0 to 9, Pgh.	1.50	1.50	1.45	1.50
Barb wire, galv., Pittsburgh...	2.00	2.00	1.95	1.95

Coke, Connellsville,

Per Net Ton at Oven:				
Furnace coke, prompt shipment	\$2.40	\$2.25	\$2.25	\$1.50
Furnace coke, future delivery..	2.40	2.25	2.25	1.60
Foundry coke, prompt shipment	2.00	2.40	2.40	1.85
Foundry coke, future delivery..	2.75	2.50	2.50	2.10

Metals, Per Pound:				
	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	17.75	17.75	17.65	12.60
Electrolytic copper, New York.	17.62½	17.62½	17.60	12.37½
Spelter, St. Louis.....	7.45	7.30	6.95	5.90
Spelter, New York.....	7.60	7.45	7.10	6.05
Lead, St. Louis.....	4.95	4.95	4.40	4.35
Lead, New York.....	5.10	5.10	4.50	4.50
Tin, New York.....	49.00	48.62½	46.20	38.87½
Antimony, Hallett, New York...	8.80	7.87½	7.87½	7.75
Tin plate, 100-lb. box, Pittsburgh	\$3.60	\$3.60	\$3.50	\$3.60

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.		Cents per lb.	
Gauges under ¼ in. to and including 3-16 in.....			.10
Gauges under 3-16 in. to and including No. 8.....			.15
Gauges under No. 8 to and including No. 9.....			.25
Gauges under No. 9 to and including No. 10.....			.30
Gauges under No. 10 to and including No. 12.....			.40
Sketches (including straight taper plates) 3 ft. and over			.10
Complete circles, 3 ft. in diameter and over.....			.20
Boiler and flange steel.....			.10
"A. B. M. A." and ordinary firebox steel.....			.20
Still bottom steel.....			.30
Marine steel.....			.40
Locomotive firebox steel.....			.50
Widths over 100 in. up to 110 in., inclusive.....			.05
Widths over 110 in. up to 115 in., inclusive.....			.10
Widths over 115 in. up to 120 in., inclusive.....			.15
Widths over 120 in. up to 125 in., inclusive.....			.25
Widths over 125 in. up to 130 in., inclusive.....			.50
Widths over 130 in.....			1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inc.			.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inc.			.50
Cutting to lengths or diameters under 1 ft.....			1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.			

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.50; galvanized, \$1.80. Galvanized barb wire, to jobbers, \$2; painted, \$1.70. Wire nails to jobbers, \$1.70.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.								
Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	\$1.65	\$1.70	\$1.75	\$1.80	\$1.90	\$2.00	\$2.10	\$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. and over, and zeels, 3 in. and over, 1.40c. Other shapes and sizes are quoted as follows:

	Cents per lb.	
I-beams over 15 in.....	1.45	1.50
H-beams over 18 in.....	1.45	1.50
Angles over 6 in.....	1.45	1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909.....	1.45	1.50
Tees, 3 in. and up.....	1.45	1.50
Angles, channels and tees, under 3 in. plus full extras as per steel bar card Sept. 1, 1909....	1.45	1.50
Deck beams and bulb angles.....	1.70	1.75
Hand rail tees.....	2.15	2.30
Checkered, trough and corrugated floor plates	2.30	2.55

Extras for Cutting to Length

	Cents per lb.	
Under 3 ft., to 2 ft. inclusive.....	.25	
Under 2 ft., to 1 ft. inclusive.....	.50	
Under 1 ft.....	1.55	
No charge for cutting to lengths 3 ft. and over.		

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.

	Cents per lb.	
Nos. 3 to 8.....	1.45	
Nos. 9 and 10.....	1.50	
Nos. 11 and 12.....	1.55	
Nos. 13 and 14.....	1.60	
Nos. 15 and 16.....	1.70	

Box Annealed Sheets, Cold Rolled.

Nos. 10 to 12.....	1.75	1.80
Nos. 13 and 14.....	1.80	1.85
Nbs. 15 and 16.....	1.85	1.90
Nos. 17 to 21.....	1.90	1.95
Nos. 22, 23 and 24.....	1.95	2.00
Nos. 25 and 26.....	2.00	2.05
No. 27.....	2.05	2.10
No. 28.....	2.10	2.15
No. 29.....	2.15	2.20
No. 30.....	2.25	2.30

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11.....	2.25	2.30
Nos. 12, 13 and 14.....	2.35	2.40
Nos. 15 and 16.....	2.50	2.55
Nos. 17 to 21.....	2.65	2.70
Nos. 22, 23 and 24.....	2.75	2.80
Nos. 25 and 26.....	2.95	3.00
No. 27.....	3.10	3.15
No. 28.....	3.25	3.30
No. 29.....	3.35	3.40
No. 30.....	3.55	3.60

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

Corrugated Roofing Sheets by Weight.

	Gauges, cents per 100 lb.			
	29	25 to 28	19 to 24	12 to 18
Painting.				
Regular or oiling.....	0.15	0.10	0.05	
Graphite, regular.....	0.25	0.15	0.10	
Forming.				
2, 2½, 3 and 5 in. corrugated	0.05	0.05	0.05	0.05
2 V-crimped, without sticks..	0.05	0.05	0.05	
¼ to 1¼ in. corrugated.....	0.10	0.10	0.10	
3 V-crimped, without sticks..	0.10	0.10	0.10	
Pressed standard seam, with cleats.....	0.15	0.15		
Plain roll roofing, with or without cleats.....	0.15	0.15		
Plain brick siding.....	0.20			
3-15-in. crimped.....	0.20	0.20		
Weatherboard siding.....	0.25	0.25		
Beaded ceiling.....	0.25	0.25		
Rock face brick and stone siding.....	0.25	0.25		
Roll and cap roofing, with caps and cleats.....	0.25	0.25		
Roofing valley, 12 in. and wider.....	0.25	0.25		
Ridge roll and flashing (plain or corrugated).....	0.65	0.65	0.65	

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		Standard Charcoal Iron.	
1½ in. to 2½ in.....	62	1½ in. to 2½ in.....	46
2½ in. to 3½ in.....	64½	2½ in. to 3½ in.....	48
3½ in. to 4 in.....	69½	3½ in. to 4 in.....	53
4 in. to 5 in.....	72	4 in. to 5 in.....	55½
5 and 6 in.....	64½	5 in. to 6 in.....	58
7 to 13 in.....	62	Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2½ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (card weight), in effect from September 10, 1912, one point greater being allowed on merchant weight; iron pipe (full weight), from September 3, 1912.

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
<i>Butt Weld.</i>				
1/8 and 1/4 in.	72	52	65	48
3/8 in.	72	52	67	51
1/2 in.	76	66	70	57
3/4 to 3 in.	79	71	..	..
3/4 to 1 1/2 in.	..	..	73	62
2 and 2 1/2 in.	..	..	74	63
<i>Lap Weld.</i>				
1 1/4 in.	..	..	58	48
1 1/2 in.	..	..	69	59
2 in.	76	68	70	61
2 1/2 to 4 in.	..	..	72	64
2 1/2 to 6 in.	78	70	..	..
4 1/2 to 6 in.	..	..	71	63
7 to 12 in.	76	66	69	56
13 to 15 in.	53	..	..	..
<i>Plugged and Reamed.</i>				
1 to 1 1/2 in., butt weld.	..	..	71	60
1 to 2 in., butt weld.	77	69	72	..
2 in., butt weld.	..	..	72	61
1 1/4 in., lap weld.	..	..	56	46
1 1/2 in., lap weld.	..	..	67	57
2 in., lap weld.	74	66	68	59
2 1/2 to 4 in., lap weld.	76	68	70	62
<i>Butt Weld, extra strong, plain ends.</i>				
1/8, 1/4 and 3/8 in.	68	58	..	..
3/8 in.	..	..	64	53
1/2 in.	73	67	68	61
3/4 to 1 1/2 in.	77	71	72	63
2 to 3 in.	78	72	..	..
2 in. and 2 1/2 in.	..	..	73	64
<i>Lap Weld, extra strong, plain ends.</i>				
1 1/2 in.	..	..	66	60
2 in.	74	66	67	61
2 1/2 to 4 in.	76	68	71	64
4 1/2 to 6 in.	75	67	70	63
7 to 8 in.	68	58	64	54
9 to 12 in.	63	53	59	48
<i>Butt Weld, double extra strong, plain ends.</i>				
1/2 in.	63	57	58	50
3/4 to 1 1/2 in.	66	60	61	53
2 and 2 1/2 in.	68	62	63	55
<i>Lap Weld, double extra strong, plain ends.</i>				
2 in.	64	58	56	50
2 1/2 to 4 in.	66	60	61	55
4 1/2 to 6 in.	65	59	60	54
7 to 8 in.	58	48	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Pittsburgh

PITTSBURGH, PA., September 18, 1912.

The Carnegie Steel Company is advising its customers that it cannot take new orders for any material for delivery this year, and has put its minimum price on plates and shapes at 1.40c. for first quarter delivery and on steel bars at 1.35c. The Jones & Laughlin Steel Company is understood to be holding plates and shapes at 1.45c. and steel bars at 1.35c. for first quarter. There is no falling off in specifications against contracts and the mills are not catching up on deliveries. Pig iron is in more active demand. The famine in open hearth steel does not seem to abate, and it is hard to find a mill that has any to sell. A heavy tonnage of furnace coke is under negotiation for first half and some for all of next year, but makers ask \$2.50 at oven and buyers contend that this price is too high. One large deal involving 54,000 tons of furnace coke per month over all of 1913 is likely to be closed this week. The scrap market is stronger, prices on some grades having improved about 50c. a ton, with indications of going higher. The whole situation is as strong in every way as it could possibly be.

Pig Iron.—The report that the Youngstown Sheet & Tube Company has an inquiry out for 40,000 to 50,000 tons of basic iron is officially denied. It does not expect to buy any basic iron before March or April. A local consumer has inquiries out for 6000 to 8000 tons of Bessemer for first quarter and has been quoted \$15.50 to \$16, Valley furnace. Two sales of 2000 tons each of standard Bessemer, for delivery in the first four months of 1913, are reported at \$15.50. We quote: Bessemer, \$15 to \$15.50; basic, \$14.25 to \$14.50; malleable Bessemer, \$14.50; No. 2 foundry, \$14.50 and gray forge \$13.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—It is hard to find a mill that has any open hearth steel to sell for this year, and Bessemer is also scarce. Most of the steel available for delivery within four to six weeks is in the hands of dealers and on this they are asking premiums. The Carnegie Steel Company is sending out a stock list of odd sizes of open hearth forging blooms and billets which have accumulated at its Homestead works, and on which it can make prompt shipments. We quote Bessemer billets at \$24 to \$24.50; Bessemer sheet bars \$24.50 to \$25; open hearth billets \$24.50 to \$25 and open hearth sheet bars about \$25.50, Pittsburgh or Youngstown mills, and for delivery within six to eight weeks. Axle billets are very strong at about \$30, and forging billets for general forging purposes are about \$32, f.o.b. mill Pittsburgh.

Ferroalloys.—Sales of several lots of 80 per cent. English ferromanganese for first half are reported at \$56.50, Baltimore. It has been sold for prompt shipment in carload lots at \$58 to \$60, Baltimore. The rate for delivery in the Pittsburgh district is \$1.95 a ton. Ferromanganese is now selling at \$20 a ton and ferrosilicon at \$15 a ton higher than a year ago. We quote 50 per cent. ferrosilicon in lots up to 100 tons at \$72.50; over 100 tons to 600 tons, \$71.50, and over 600 tons, \$70.50, Pittsburgh. The lower grades are ruling at \$20 for 10 per cent., \$21 for 11 per cent. and \$22 for 12 per cent., f.o.b. cars at Ashland, Ky., or Jackson, Ohio. On ferrotitanium we quote 8c. per lb. for carload lots, 10c. per lb. in 2000-lb. lots and over and 12 1/2c. per lb. in lots up to 2000 lb.

Steel Rails.—The Carnegie Steel Company has received through the United States Steel Products Company an order for 12,000 tons of rails for delivery to the Siamese Government Railways, and has also taken a number of other good contracts for standard sections for foreign shipment. The company is instructing its selling agents to urge on the railroads the necessity of placing contracts for open hearth rails for 1913 delivery as early as possible so that they can be placed on the rolling schedule. New orders and specifications for light rails in the past week amounted to about 4000 tons. We quote splice bars at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45-lb. sections, 1.25c.; 16 and 20-lb., 1.30c.; 12 and 14-lb., 1.35c., and 8 and 10-lb., 1.40c., all in carload lots f.o.b. Pittsburgh.

Wire Rods.—We note a sale of 500 tons of open hearth rods for last quarter at \$27, Pittsburgh. We quote Bessemer, open hearth and chain rods at \$27, Pittsburgh.

Muck Bar.—A local consumer is reported to have bought 2000 tons of muck bar last week at \$31, but the maker has not been disclosed. None of the puddling mills here is able to operate full on account of the scarcity of puddlers and this keeps down the supply of muck bar, which is very strong at \$31, Pittsburgh, for standard grades.

Skelp.—The skelp mills are reported to be making slightly better deliveries but are still pretty well sold up and the market is strong. We quote grooved steel skelp at 1.30c. to 1.35c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.75c. to 1.80c., delivered at buyer's mill in the Pittsburgh district.

Structural Material.—The minimum prices of the Carnegie and the Jones & Laughlin steel companies on shapes is now 1.40c. No important contracts have been taken by local fabricators in the past week, largely for the reason that they are filled up for this year and cannot bid on work wanted until first quarter or later. New inquiry is very heavy, one leading local fabricator stating it could easily fill up for two years if it desired to do so at present prices. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., f.o.b. Pittsburgh, for first quarter.

Plates.—The Northern Pacific has placed 2500 center construction steel underframes for box cars and the Wabash 500 steel hoppers with the Western Car & Foundry Company. New inquiries for cars are light. The T. A. Gillespie Company of this city has taken the contract for the laying of the new water line for the city of Akron, which will be constructed of lock bar pipe, and the Carnegie Steel Company will furnish the plates, about 3500 tons. We quote 3/4-in. and heavier plates at 1.40c. to 1.45c. for shipment at convenience of the mill or in first quarter, while premiums of \$2 to \$3 a ton are being obtained over these prices by smaller mills that can make deliveries in six to eight weeks.

Iron and Steel Bars.—While the Republic Iron & Steel Company is the only maker that has formally

announced the opening of its books for contracts for steel bars for delivery in first quarter of 1913 at 1.35c. f.o.b. Pittsburgh, the Jones & Laughlin and Carnegie steel companies are accepting contracts at this price for the same delivery from customers requesting them to do so. A fair amount of such business has been placed. The price on steel bars for delivery over the remainder of this year is also 1.35c., but most makers have practically no bars to spare for last quarter, and a premium of \$1 to \$2 a ton is easily obtained by any mill that will promise delivery in three or four weeks. Iron bars are quite active. We quote merchant steel bars at 1.35c. for delivery over the remainder of this year and into first quarter of 1913, and common iron bars at 1.45c. to 1.50c. at mill for the remainder of this year, several makers stating they are holding firm at the higher price. Makers of steel bars have recently put into effect a schedule of extras for twisting, this being $\frac{3}{4}$ in. and larger, \$1 per net ton; $\frac{1}{2}$ and $\frac{3}{8}$ in., \$2 per net ton. Formerly twisted bars were held at regular base prices, but owing to the activity in the bar market it has been decided by the makers to charge these extras.

Hoops and Bands.—Some contracts for first quarter have been placed on the basis of 1.35c. for bands and 1.45c. for hoops. We quote steel bands at 1.35c., with extras as per the steel bar card, and hoops at 1.45c. f.o.b. Pittsburgh for the remainder of this year and first quarter of 1913. Most makers are practically sold up for this year.

Sheets.—As indicating the sold up condition of the sheet mills, we note that a large Ohio consumer came in the market last week for 1000 tons of galvanized sheets for delivery this year, and the inquiry was submitted to eight of the larger mills. None could promise the delivery wanted, and only two quoted on the order and they quoted on black sheets. All the sheet mills are running to as full capacity as the supply of steel and labor will admit. It is stated that several fairly large contracts for black and galvanized sheets for first quarter have been placed on the basis of 2.10c. to 2.15c. for No. 28 black and 3.25c. to 3.30c. for No. 28 galvanized.

Tin Plate.—There is little new demand. As the season is drawing to a close, specifications against contracts are commencing to fall off. The mills are still being asked by large consumers, especially can makers, to accept contracts for first quarter of 1913 delivery, but most of them are still inclined to hold off until October, though some sales for next year are reported to jobbers and also to consumers. The American Sheet & Tin Plate Company is operating to about 95 per cent., and other makers to full capacity. The supply of steel is reported as slightly better, but there is still a shortage of labor. We quote tin plate at \$3.60 per box for 14 x 20 coke plates, f.o.b. Pittsburgh, for this year, and it is possible that one or two makers would accept business for first quarter at that price.

Bolts and Rivets.—It is likely that before this week is out there will be a further advance on both bolts and rivets of about 5 per cent., which will put structural rivets at \$2 and boiler rivets at \$2.10, the highest prices they have reached for several years. The new demand continues very active. Prices as now in effect are as follows: Button head structural rivets, \$1.90 per 100 lb. base; cone head boiler rivets, \$2 in carloads only, an advance of 10c. to 15c. being charged for smaller lots. Discounts on bolts are as follows: Coach and lag screws, 80 and 12½ per cent. off; small carriage bolts, cut threads, 75, 10 and 7½ per cent. off; small carriage bolts, rolled threads, 75, 10, 10 and 2½ per cent. off; large carriage bolts, 70, 10 and 5 per cent. off; small machine bolts, rolled threads, 75, 10, 10 and 7½ per cent. off; small machine bolts, cut threads, 75, 10, 10 and 2½ per cent. off; large machine bolts, 70, 10 and 10 per cent. off; square hot pressed nuts, blank and tapped, \$6 off, and hexagon nuts, \$6.70 off. These prices are in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works.

Shafting.—The new demand is fairly heavy. The leading makers have a large amount of business on their books for delivery this year and are not inclined to make further commitments at present discounts. It is not unlikely that there will be an advance in the near future. We quote cold rolled shafting at 60 per cent. off in carloads and 57 per cent. in less than carloads delivered in base territory.

Spelter.—The market is still very strong. Prime grades of Western have sold at 7.35c. to 7.40c., East St. Louis, equal to 7.47½c. and 7.50c., f.o.b. Pittsburgh. A sale of 300 tons for October and November delivery is reported to have been made at 7.35c., East St. Louis.

Railroad Spikes.—Makers have advanced prices to \$1.80 for the remainder of this year and first quarter of 1913. The New York Central has placed an order for about 50,000 kegs for first quarter at the reported price of \$1.80 f.o.b. Pittsburgh, the business having been divided among three leading makers. It is probable that other roads will cover on their requirements of spikes for first quarter and first half of next year within a short time. We quote railroad spikes in base sizes 5½ x 9/16 in., and also small railroad and boat spikes, at \$1.80 per 100 lb. f.o.b. Pittsburgh.

Wire Products.—Mills report that specifications against contracts for wire and wire nails are coming in more freely than for some time. It is said that practically all the contracts for wire nails taken at the \$1.60 price have been cleaned up or canceled, so that the greater part of the business now on the books of the mills in wire nails is at the \$1.65 and \$1.70 basis. The market is firm, and there are intimations, but not from an official source, of a further advance in the near future. We quote wire nails at \$1.70 per keg; cut nails \$1.60 to \$1.65; galvanized barb wire, per 100 lb., \$2; painted, \$1.70; annealed fence wire \$1.50, and galvanized fence wire \$1.80, f.o.b. Pittsburgh, usual terms, freight added to point of delivery. Jobbers charge the usual advances over these prices for small lots from store.

Merchant Steel.—Specifications against contracts are still coming in freely, but the new demand is only fairly active, consumers being pretty well covered. Prices are very firm, and we quote: Iron finished tire, 1½ to ¾ in. and larger, 1.30c., base; under ¾ in., 1.40c.; planished tire, 1.50c.; channel tire, ¾, ¾ and 1 in., 1.80c.; 1½ in. and larger, 1.65c.; toe calk, 1.85c., base; flat sleigh shoe, 1.35c.; concave and convex, 1.70c.; cutter shoes, tapered or bent, 2.30c.; spring steel, 1.90c.; machinery steel, smooth finish, 1.70c., all f.o.b. cars, Pittsburgh.

Merchant Pipe.—A foreign inquiry is in the market for about 600 miles of 6, 8 and 10-in. pipe for an oil line. It is not unlikely that the business, if placed, will be divided between German and Pittsburgh mills. The Philadelphia Company of this city is in the market for 18 miles of 6-in. iron pipe. The new demand for merchant pipe continues heavy. An average advance of one point, or \$2 a ton, has been made in oil country goods to correspond with the recent advance in iron and steel pipe. The new card on these products is identical in form to the revised classification on merchant pipe. Casing was not advanced, and in fact a slight reduction was made on one size. Most of the pipe mills have their entire output practically sold up for the rest of this year.

Boiler Tubes.—It is not unlikely that charcoal iron tubes will be advanced in the near future. The new demand for both locomotive and merchant tubes is heavy, all the mills being much behind in shipments.

Coke.—Inquiries for furnace coke for delivery in first half are heavy. A Mahoning Valley steel company has an inquiry out for a total of 54,000 tons a month for all of next year. The contract may include 16,000 tons per month from April or May next year for another furnace. Owing to the desirability of this contract, it is expected that it will be placed at a better figure than the going price. A Shenango Valley furnace company is in the market for 30,000 tons per month for the first half. Four other furnace interests are inquiring for about 10,000 tons each per month for first half. While \$2.50 is generally being quoted on standard grades of furnace coke for the first half, it is not improbable that some operators would sell on desirable contracts at \$2.40 per net ton at oven. The foundry coke market is also stronger, but there is not much new inquiry. We quote standard grades of furnace coke for prompt shipment at \$2.40 to \$2.50 and for first half at \$2.50 per net ton at oven. Standard makes of 72-hr. foundry coke are held at \$2.75 to \$3 per net ton at oven for first half, but some makes not so well known are offered at \$2.60. The output in the Upper and Lower Connellsville regions last week was 357,839 net tons, a decrease over the previous week of 14,076 tons.

Old Material.—The market is much stronger. While all consumers have a good deal of material on hand, they are using such large quantities that they are taking in more or less steadily. A local interest has bought in the past week upward of 10,000 tons of heavy selected steel scrap for which it paid \$14 and \$14.25. Sales of 6000 to 8000 tons of heavy steel scrap for Sharon and Youngstown delivery have been made at \$14 to \$14.25. Sales of 800 to 1000 tons of turnings have been made at about \$11 and 500 tons of borings

at about \$10 delivered. Brokers are not inclined to sell freely, believing that the market will be better. An embargo on scrap is still on at the plant of the West Penn Steel Company, but has been lifted at the works of the Pittsburgh Steel Company. We have advanced prices on heavy steel scrap, wrought iron turnings, cast iron borings, low phosphorus melting stock and bundled sheet scrap. Dealers quote as follows, per gross ton:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	\$14.25 to \$14.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	12.75 to 13.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	15.00 to 15.25
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	9.75 to 10.00
Low phosphorus melting stock	16.50 to 16.75
Iron car axles	24.50 to 25.00
Steel car axles	16.50 to 16.75
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
*Cast iron borings	10.00 to 10.25
*Machine shop turnings	11.00 to 11.25
†Sheet bar crop ends	15.00 to 15.25
Old iron rails	15.75 to 16.00
No. 1 R. R. wrought scrap	14.75 to 15.00
Heavy steel axle turnings	11.00 to 11.25
Stove plate	10.25 to 10.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

Chicago

CHICAGO, ILL., September 17, 1912.

Further advances in the price of pig iron and in the prices of steel both from mill and warehouse stock show the pulse of the past week's market. For pig iron the advance of \$1 a ton in the week was especially sharp. All grades were affected, including Northern and Southern coke and charcoal iron. Buying continues heavy. Jobbers' quotations on structural shapes, plates and bars were advanced \$1 a ton, and on galvanized sheets an additional advance of \$3 a ton follows the upward trend in spelter. Mill prices on steel bars are now 1.35c., Pittsburgh, at which price business can be placed for first half shipment. Prompt shipment orders, which include nearly all business for delivery this year, are placed, generally speaking, on a premium basis. Light rail prices have been advanced \$1 per ton. It is not yet apparent that the rapid rise in prices or the premiums which are being asked have affected this market adversely or otherwise. Actual needs still appear to be the incentive for buying and the lower prices at which contracts may be made into next year, on the one hand, and the premium prices \$2 and \$3 a ton higher on the other hand mark the distinction between consumers' expected requirements of the next six months and their immediate needs.

Pig Iron.—Advances in price featured the local pig iron market the past week, \$1 a ton more now being asked for Northern and Southern coke and for Lake Superior charcoal irons. Southern iron is not so clearly upon the higher basis represented by the asking price of \$14, announced by three important Birmingham interests, although several thousand tons is reported sold on that basis, for at this writing strictly Birmingham iron can still be had at \$13.50 and other Southern irons are obtainable at \$13. The attractiveness of the lower prices at the end of the week, however, is evidenced by sales of nearly 20,000 tons within a few days. The interests making the advance to \$14 are understood to have made heavy sales in the South and for export at prices under \$13, one being credited with 52,000 tons and another 80,000 tons. Ohio furnaces selling into this territory are on a \$15 basis at furnace, and in certain instances are withdrawn from the market for the present, following sales in one week aggregating 50,000 tons. Virginia irons have been advanced to the basis of \$14.50 and \$15 at furnace for first and second quarter respectively, and as they carry from 2½ to 3 per cent. silicon and are high in manganese they are practically on a competitive basis with local irons which have been advanced to \$17 at furnace. Local iron, which was obtainable at \$16 f.o.b. furnace at the beginning of the week, advanced first to \$16.50 and almost immediately to \$17. For malleable Bessemer and basic iron this price is apparently a minimum. For foundry irons some leeway exists attributable to analysis variations, and \$16.50 can be done on certain lots. Charcoal iron now commands a minimum price of \$17.75 delivered at Chicago or Milwaukee. Buying is still brisk. We quote

local irons, f.o.b. furnace, the average switching charge to Chicago foundries being nearly 50c. per ton. Other quotations are for Chicago delivery. Prices on prompt shipment are as follows:

Lake Superior charcoal	\$17.75 to \$18.25
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1 foundry and No. 1 soft	17.85 to 18.35
Southern coke, No. 2 foundry and No. 2 soft	17.35 to 17.85
Southern coke, No. 3	16.85 to 17.35
Southern coke, No. 4	16.35 to 16.85
Southern gray forge	16.10 to 16.35
Southern mottled	16.10 to 16.35
Malleable Bessemer	17.00
Standard Bessemer	17.50 to 18.00
Basic	17.00
Jackson County and Kentucky silvery, 6 per cent.	17.90
Jackson County and Kentucky silvery, 8 per cent.	18.90
Jackson County and Kentucky silvery, 10 per cent.	19.90

Rails and Track Supplies.—No further developments in the placing of rail tonnage for 1913 are reported, although negotiations which have included not only rails but rail joints, spikes and bolts, have progressed to the point of a fairly definite understanding. Light rails have been advanced \$1 a ton, putting 25 to 45-lb. sections on the same basis as standard sections. Higher quotations for tie plates are also noted. We quote standard railroad spikes at 1.80c. to 1.85c., base; track bolts with square nuts, 2.20c. to 2.30c. base, all in car-load lots, Chicago; tie plates, \$30 to \$32.50 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Contracts reported during the past week include 1260 tons for a pier at San Diego, Cal., let to the American Bridge Company; 1153 tons for the connecting tunnel at the Indiana Harbor works of the Inland Steel Company, awarded to the Strobel Steel Construction Company; the Hansel-Ellcock Company will furnish 453 tons for a Northwestern University dormitory; the Morava Construction Company, 459 tons for an addition for Marshall Field & Co.; the Vierling Steel Company, 754 tons for the Devoe Building, Chicago; the Wisconsin Bridge Company, 283 tons for girder spans for the Chicago, Milwaukee & St. Paul Railroad; the Northwest Steel Company, 173 tons for the Pacific Telephone & Telegraph Company's building at Portland, Ore. For the new warehouse of the International Harvester Company, Chicago, 383 tons was placed; 885 tons for the American National Insurance Company building, Galveston, Texas; 240 tons for the Soo Line bridge girders, and 150 tons for the Austin, Texas, postoffice. On the basis of 1.40c., Pittsburgh, the leading interest is taking some structural business for delivery in the first half of next year, more particularly for second quarter shipment. Mill orders for structural steel, aside from specifications, are for the most part for such delivery. We quote for Chicago delivery mill shipment on plain shapes, 1.58c. to 1.68c.

For prompt shipment store prices are now but little above the premium basis upon which mills are accepting orders and purchases running into unusually large tonnages are being made from jobbers' stocks. Local warehouses are experiencing some difficulty in maintaining a full range of sizes owing to the heavy demand. Store prices in the week were advanced \$1 a ton and we quote for base sizes 2c.

Plates.—Quotations made by Eastern plate mills for Chicago delivery in the past week revealed a mill price of 2c., eastern Pennsylvania. While this is not a criterion, it is indicative of some phases of the situation. Prices equivalent to 1.60c., Pittsburgh, are more common for orders requiring delivery in about six weeks. New railroad buying includes 10 locomotives for the Great Northern and 10 for the Chicago, Burlington & Quincy, ordered from the Baldwin Locomotive Works, and 10 from the American Locomotive Company by the Soo Line. The Chicago, Burlington & Quincy also bought 1000 gondola cars from the American Car & Foundry Company and the Wabash is still in the market for 1000 cars. We quote for Chicago delivery mill shipment 1.58c. to 1.68c.

Store prices for plates were advanced \$1 a ton in the past week but there is no evidence that the demand for prompt shipment out of stock has been affected thereby and jobbers are experiencing difficulty both in maintaining their stocks and preserving the promptness of shipment. We quote base price out of store 2c.

Sheets.—The advance in mill prices on sheets places prompt shipment business on the same basis as reser-

variations for first and second quarter shipment. As the available capacity in black and galvanized sheets for the remainder of this year is very limited, the new prices are easily obtained. The situation is not so restricted with reference to blue annealed for which from four to six weeks' delivery can be promised by some of the larger mills; a less pronounced advance in the price of blue annealed sheets was the corresponding result. We quote Chicago delivery in carload lots from mill as follows: No. 28 black sheets 2.33c.; No. 28 galvanized 3.48c. and No. 10 blue annealed 1.78c.

The continued high price of spelter has necessitated higher quotations for galvanized sheets which are somewhat out of line with the prices of other grades. An additional advance of \$3 a ton on galvanized sheets out of store is noted. We quote on sheets from jobbers' stocks, as follows: No. 10 blue annealed, 2.15c.; No. 28 black, 2.70c. and No. 28 galvanized, 3.95c.

Bars.—Coincident with the announcement of one of the leading makers of steel bars that it had no further tonnage to offer for 1912 and that its price for first quarter was on the basis of 1.35c., Pittsburgh, that price became the general market basis for a new contract business. Current requirements continue to be filled by the paying of premium of about \$3 a ton in advance of the contract schedule. Specifications are heavy and considerable new business is being placed for the first half of next year. For bar iron, while a minimum price of 1.45c. at the mill now obtains some tonnage has been placed at prices \$1 a ton higher. Local mills are beginning to feel some pressure for hard steel bars and one interest has withdrawn except on a limited range of specifications. Prompt shipment orders for hard steel bars demand a price of 1.60c., Chicago. We quote for mill shipment, as follows: Bar iron 1.45c. to 1.50c.; soft steel bars, 1.53c. to 1.78c.; hard steel bars, 1.40c. to 1.60c.

Warehouse prices on soft steel bars have been advanced \$1 a ton and we quote soft steel bars 1.90c.; bar iron, 1.90c.; reinforcing bars, 1.90c., base, with 5c. extra for twisting in sizes 3/4 in. and over, and 7 1/2c. extra for smaller sizes; shafting, 57 per cent. off.

Old Material.—Prices in this market continue to follow the trend of quotations for finished material, and advances on all grades of 25c. and 50c. per ton are noted. A considerably less restricted movement of old material is reported, and while no new railroad offerings have appeared dealers are apparently more willing to dispose of their stocks. One offer of 3500 tons of mixed grades is noted. While a limited tonnage of old material offered by the railroads in the past several weeks has contributed materially to the strength of the market it has become apparent that melters have acquired a considerable portion of their supply direct from railroads on trade deals for bars. The leading consumer of heavy melting steel has advanced its price 50c. per ton and is again accepting limited shipments. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	.....	\$17.00 to \$17.50
Old steel rails, rerolling	.....	14.75 to 15.25
Old steel rails, less than 3 ft.	.....	13.50 to 14.00
Relaying rails, standard section, subject to inspection	.....	24.00
Old car wheels	.....	14.50 to 15.00
Heavy melting steel scrap	.....	12.75 to 13.25
Frogs, switches and guards, cut apart	.....	12.75 to 13.25
Shoveling steel	.....	12.50 to 13.00
Steel axle turnings	.....	10.00 to 10.50

Per Net Ton.

Iron angles and splice bars	.....	\$15.25 to \$15.75
Iron arch bars and transoms	.....	16.75 to 17.25
Steel angle bars	.....	12.25 to 12.75
Iron car axles	.....	21.25 to 21.75
Steel car axles	.....	16.50 to 17.00
No. 1 railroad wrought	.....	13.00 to 13.50
No. 2 railroad wrought	.....	12.00 to 12.50
Cut forge	.....	12.00 to 12.50
Steel knuckles and couplers	.....	12.00 to 12.50
Steel springs	.....	12.50 to 13.00
Locomotive tires, smooth	.....	13.25 to 13.75
Machine shop turnings	.....	7.75 to 8.25
Cast and mixed borings	.....	6.75 to 7.25
No. 1 busheling	.....	11.00 to 11.50
No. 2 busheling	.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	.....	8.50 to 9.00
Boiler punchings	.....	12.75 to 13.25
No. 1 cast scrap	.....	12.75 to 13.25
Stove plate and light cast scrap	.....	11.00 to 11.50
Railroad malleable	.....	12.50 to 13.00
Agricultural malleable	.....	11.00 to 11.50
Pipes and flues	.....	10.00 to 10.50

Rivets and Bolts.—Leading bolt makers are being hard pressed by customers for deliveries and at the same time specifications continue so heavy that shipments are increasingly delayed. Delivery promises on bolts now run from 90 to 120 days. On rivets and track bolts the condition of producers is quite satisfactory and from four to six weeks can be done in most instances. We quote from mill as follows: Carriage bolts

up to 3/8 in. x 6 in., rolled thread, 75-10-10-2 1/2; cut thread, 75-10-7 1/2; larger sizes, 70-10-5; machine bolts up to 3/8 in. x 4 in., rolled thread, 75-10-10-7 1/2; cut thread, 75-10-10-2 1/2; larger sizes, 75 and 10; coach screws, 80-12 1/2; hot pressed nuts, square head, \$6 off per cwt.; hexagon, \$6.70 off per cwt. Structural rivets, 3/4 to 1 1/4 in., 1.98c. to 2.08c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Out of store we quote for structural rivets 2.20c. and for boiler rivets 2.30c. to 2.50c. Machine bolts, rolled thread, 80 per cent. off; cut thread, 75 per cent. off.

Cast Iron Pipe.—The contract for 2700 tons of distributing pipe for Akron, Ohio, was awarded to the United States Cast Iron Pipe & Foundry Company. This company is also the low bidder on 2800 tons for Dayton, Ohio, and for approximately 4500 tons for Los Angeles, Cal. At Fort William, Canada, an award of 800 tons was made to the Canada Iron Corporation. Waterworks improvements are contemplated at Appleton, Wis., and Freeport, Ill. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$30; 6 to 12 in., \$28; 16 in. and up, \$27, with \$1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., September 17, 1912.

Consumers are still making efforts to cover for extended requirements while most sellers are accepting business on a very conservative basis. Few direct quotations for rolled steel products for contracts involving shipment beyond the year end have come out, while a wider range is noted for deliveries over the remainder of the year, advances having been made by several mills during the week. Pig iron prices, particularly for foundry grades, are steadily moving upward. An unexpected demand for rolling mill forge iron has resulted in an advance of 25c. to 50c. a ton. An active demand for heavy plates is noted, particularly from Western consumers, who pay premiums for early shipment quite freely. Both iron and steel bars are in good demand. Heavy sales of Newfoundland ore for next year's delivery at advanced prices are noted. Recent rail orders include 10,000 tons of Mayari Bessemer for a Southwestern railroad and 5000 tons of the same character for the New York Central Railroad. These will be rolled by the Maryland Steel Company, which has also received orders recently for two moderate sized vessels for the Chesapeake Steamship Company. Eastern shipyards are figuring on several new inquiries for ocean going steamships. Sales of round lots of mountain furnace coke have been made to Eastern consumers.

Iron Ore.—The most important transaction involved the sale of an aggregate of 100,000 tons of Wabana, Newfoundland, ore to several consumers in this district for 1913 delivery, at an advance of 25c. a ton over prices paid for this year's ore. Negotiations for a further tonnage for next year's delivery are pending. Mediterranean and other European ores are practically out of the market, owing to the inability to get bottoms for transportation, as well as the high freights. Consumers are showing decidedly more interest in the ore situation as the prospect for increasing pig iron production becomes more favorable, and considerable business in domestic ores is expected to develop. Importations last week included 6604 tons of Swedish and 4050 tons of Cuban ore.

Pig Iron.—Price fluctuations in foundry grades keep buyers guessing. Some producers, being sold up for the remainder of the year and unwilling to sell ahead, are practically out of the market. Others, having a limited supply available for this year's delivery, have marked prices up, \$16.75, delivered, being their minimum for standard No. 2 X for fourth quarter, while some ask \$17. The leading Virginia interest has announced a new schedule of prices, quoting No. 2 plain and No. 3 foundry for fourth quarter at \$14 and \$13.75 at furnace, respectively, no No. 2 X being available for this delivery; for first quarter \$14.50 is quoted for No. 2 X, and \$14 for No. 2 plain; an advance of 50c. over first quarter quotations is named for second quarter, while quotations for equal monthly shipments in the first half of 1913 range from \$14.75 for No. 2 X to \$14.25 for No. 2 plain, and \$14 for No. 3, all f.o.b. furnace. Advances over these figures are daily expected. Other Virginia producers have made moderate sales of No. 2 X for fourth quarter at \$14.25, and for first quarter at \$14.50, furnace. Several inquiries for round lots of foundry iron for next year's delivery have come out. The Baldwin Locomotive Works has an inquiry for 5000 tons of "floor grades." Cast iron pipe makers have taken several lots of off grade iron, while one Delaware River interest is inquiring for 5000 tons for

first quarter delivery. Low grade irons are scarce and prices have been advancing steadily. An unexpected demand for rolling mill forge has developed from an Eastern consumer, itself a large producer for its own use. An aggregate of 10,000 tons was asked for, some part of which has already been placed. This demand brought about an advance to \$16 to \$16.50, delivered. While several inquiries for basic iron are out, no sales have been made against them and several producers have withdrawn quotations of \$16.50, delivered. A sale of a lot of several thousand tons of basic to an Eastern mill, for shipment in the fourth quarter at \$16, delivered, is reported. A fair demand for low phosphorus iron is noted; one sale of 3000 tons of standard analysis, at a price equal to \$22, delivered here, is reported, while a 500-ton lot of Lebanon Valley low phosphorus was sold at \$18, furnace. The market generally is decidedly strong. Scarcity is developing in some grades for delivery the remainder of the year, and while some additional capacity is about to become active, it will not materially affect the foundry iron situation in this district. The range of prices for standard brands of iron, delivered in buyers' yards in this district the remainder of the current year, is quoted about as follows:

Eastern Pennsylvania No. 2 X foundry.....	\$16.75 to \$17.00
Eastern Pennsylvania No. 2 plain.....	16.50 to 16.75
Virginia No. 2 X foundry.....	17.05 to 17.25
Virginia No. 2 plain.....	16.80 to 17.00
Gray forge.....	16.00 to 16.50
Basic.....	16.00 to 16.50
Standard low phosphorus.....	21.50 to 22.00

Ferroalloys.—Quotations for 80 per cent. ferromanganese, for either prompt or next year's delivery, are rather hard to define. Business submitted at figures below \$56.50 to \$57, seaboard, is promptly declined. Even at the quotations named it is difficult to get foreign producers to accept business for next year's delivery. While sales of prompt ferromanganese could be made there is practically none available for such delivery. Ferrosilicon is quiet and quotations are unchanged.

Billets.—The current demand aggregates sufficient tonnage, together with specifications against contracts, to keep mills fully engaged. Nearly all mills are sold up pretty fully for this year and have not yet opened order books for 1913 delivery. Basic open hearth rolling billets are nominally quoted at \$27.90, delivered in this district. Ordinary forging billets are quoted at \$30, minimum, f.o.b. Eastern mill. Premiums of several dollars a ton continue to be paid for prompt shipments on both rolling and forging billets.

Plates.—A prominent Eastern mill announces the following minimum quotations for deliveries in this territory: September-October shipment, sheared, 1.65c.; universal, 1.70c. November shipment, sheared, 1.70c.; universal, 1.75c. December shipment, sheared, 1.75c.; universal, 1.80c. In addition to the price for September-October premiums of several dollars a ton are paid for prompt shipment. Some few producers, but who are unable to make good delivery, continue to name lower prices than are quoted above. Orders are coming in to some makers three times as great as the mill output, and producers are running at top capacity to keep up with the demand. Several inquiries of good size for ship plates are noted. No quotations for deliveries beyond the year end have yet been announced.

Structural Material.—New business in which any sizable propositions are involved continues light, although current orders for plain shapes in miscellaneous lots are numerous and aggregate a very satisfactory total. Mills are being pressed for deliveries on specifications against contracts and are getting farther behind. The contract for the Chesapeake & Ohio piers at Newport News is reported as going to a central Pennsylvania producer-fabricator. Further inquiry for vessel shapes is noted. Eastern mills able to make good shipments have advanced prices to 1.65c., minimum, for car-load lots for rollings, and 1.85c., mill, from stock. Another mill names 1.60c. for rollings. Premiums of several dollars a ton are paid for prompt shipment for Western delivery.

Sheets.—Mills are taking a very satisfactory volume of current business and order books are in better shape than ever. Western inquiry for heavy sheets continues pronounced. Prices have been further advanced, the minimum on blue annealed being 1.80c. to 1.85c., delivered here. No. 28 gauge Western sheets are quoted at 2.30c. to 2.35c., delivered in this district. On No. 18 and lighter gauges Eastern mills making smooth, loose rolled sheets readily obtain an advance of ¼c. to ½c. per lb., while additional premiums are paid for prompt shipments.

Bars.—Specifications for steel bars continue heavy, with urgent requests for early deliveries. Premiums are asked for prompt shipments when mills can make them,

but few are in position to take care of business other than that now in hand. A very good demand for iron bars is noted, and some mills are well supplied with orders. For desirable specifications 1.42½c. to 1.45c. represents the market for delivery in this district, while 1.47½c., delivered, has been obtained for round lots for early shipment.

Coke.—Increasing demand with restricted production has materially strengthened the market and higher prices are being very generally quoted. Sales of two 12,000-ton lots of furnace coke to Eastern consumers, for delivery over the next six months, at \$2.45, at oven, are noted. Foundry coke is moving freely in moderate lots at prices varying from \$2.60 to \$2.75, although some grades are still available at \$2.50. The following range of prices, per net ton, represents the market for deliveries in this district:

Connellsville furnace coke.....	\$4.55 to \$4.80
Connellsville foundry coke.....	4.75 to 4.90
Mountain furnace coke.....	4.15 to 4.40
Mountain foundry coke.....	4.35 to 4.50

Old Material.—The market is less active. Mills are pretty well covered for the present. Heavy melting steel has been taken in moderate lots at \$14.75, delivered. A sale of 1000 tons of low phosphorus scrap at \$17.80 is noted. Shortage of labor has resulted in an accumulation of scrap on cars at some of the mills. Dealers are not forcing business, and some are accumulating scrap against further advances in prices. Railroad wrought is easily moved at \$16.50, delivered. A good share of the material offered on the various railroad lists has gone directly to the consumers. Turnings have been more active at \$11. The following range of prices about represents the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate ranging from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel scrap and crops.....	\$14.50 to \$15.00
Old steel rails, rerolling (nominal).....	16.00 to 16.50
Low phosphorus heavy melting steel scrap.....	17.75 to 18.25
Old steel axles.....	18.00 to 18.50
Old iron axles.....	24.00 to 25.00
Old iron rails (nominal).....	17.00 to 17.50
Old car wheels.....	14.25 to 14.75
No. 1 railroad wrought.....	16.50 to 17.00
Wrought iron pipe.....	13.25 to 13.75
No. 1 forge fire.....	12.50 to 13.00
No. 2 light iron (nominal).....	7.50 to 8.00
Wrought turnings.....	11.00 to 11.50
Cast borings.....	10.00 to 10.25
Machinery cast.....	14.00 to 14.50
Grate bars, railroad.....	11.00 to 11.50
Stove plate.....	11.00 to 11.50
Railroad malleable (nominal).....	12.50 to 13.00

Cleveland

CLEVELAND, OHIO, September 17, 1912.

Iron Ore.—An unusual situation has developed; there is a good demand for ore with practically none to be had. Considerable inquiry has come out but several of the leading mining interests have nothing for sale. Efforts to buy lots around 20,000 tons have proved futile. One company reports that in the past few weeks it has turned down inquiries aggregating close to 500,000 tons. If ore in any amount were available for sale, vessel tonnage could not be secured to move it. Practically every boat that is fit for navigation is busy and will be in commission until the close of the shipping season. Shippers having little ore left are selling it conditioned on being able to get it down the lakes before navigation closes. While ore interests have contracts for about all they will move, some are in the market for additional tonnage to cover recent sales and are offering 10c. over the regular carrying rate from Marquette and Escanaba and 15c. advance from the head of the lakes. Some boats have been placed for single cargoes at the advance, but vessel men are not taking much interest in inquiries for charters for ore even at the 15c. advance, making a 65c. rate from the head of the lakes, when they can get what is equivalent to about a 90c. ore rate for hauling grain. Recent ore inquiries have come from furnace interests that expect to need some additional ore or want to buy additional tonnage as a speculation in view of the probable advance in prices next year and from other furnace interests that would blow in stacks now idle if they could get an ore supply. The latter waited too long and have now given up hope of being able to buy enough ore to start up their furnaces before next spring. We quote prices as follows: Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; Old Range non-Bessemer, \$3.05; Mesaba non-Bessemer, \$2.85.

Pig Iron.—The market is very strong and prices on foundry grades have again been advanced. One local producer has advanced its price \$1 a ton, from \$15 to \$16

for No. 2, and another is now holding the same grade at \$15.50 to \$16. Valley makers are also asking better prices and it is claimed that little, if any, foundry iron can be had in the Valley at less than \$15 for No. 2. Some Valley producers are asking \$15.50 for the first half. Considerable new inquiry for basic iron is coming out. An inquiry from southern Ohio is for 10,000 tons and one from Chicago for 5000 tons. The demand for foundry grades in northern Ohio has improved and sales for the first half during the week aggregated 20,000 tons or over. A local foundry divided 5000 tons between two Cleveland producers at \$15 at furnace for No. 2 and other sales both for Cleveland and outside delivery made by local furnaces were at the same price. The Massillon Iron & Steel Company has an inquiry out for 6000 tons of Nos. 3 and 4 for the first quarter and several other inquiries in lots of 1200 tons and under are pending. The price advance, however, appears to have checked buying temporarily. There is some inquiry for spot and last quarter foundry iron but the supply is quite limited and premium prices for spot shipment are predicted. For prompt shipment and the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	\$15.90 to \$16.40
Basic	15.40 to 15.65
Northern No. 2 foundry	15.50 to 15.75
Southern No. 2 foundry	16.85 to 17.35
Jackson County silvery, 8 per cent. silicon ..	18.05 to 18.55

Coke.—Several producers have sold up on foundry grades for the year and have withdrawn from the market. Others have advanced prices to \$3 for prompt shipment and first half deliveries. The demand is heavy and ovens are having trouble in keeping up on shipments. Furnace coke is higher and very firm, prompt sales of small lots being reported at \$2.50. We quote standard Connellsville furnace coke at \$2.30 to \$2.50 for prompt shipment. Standard 72-hr. foundry coke is held at \$2.75 to \$3 for prompt shipment and contract.

Old Material.—The market is firmer and somewhat more active. Consumers want to buy at to-day's prices for future delivery but dealers refuse to sell at current quotations for extended delivery, being satisfied to hold for an advance which they expect will come shortly. Sharon and Mahoning Valley mills are buying more freely. Consumers are taking shipments better than they were but some are holding back on deliveries because of a scarcity of labor. The Norfolk & Western Railroad list closed Tuesday. Some quotations have been advanced. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton.	
Old steel rails, rerolling	\$14.00 to \$14.50
Old iron rails	14.00 to 14.50
Steel car axles	18.50 to 19.00
Heavy melting steel	13.00 to 13.25
Old car wheels	13.50 to 14.00
Relaying rails, 50 lb. and over	22.00 to 22.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	13.25 to 13.50
Light bundled sheet scrap	10.00 to 10.50

Per Net Ton.	
Iron car axles	\$20.00 to \$21.00
Cast borings	7.50 to 7.75
Iron and steel turnings and drillings	8.00 to 8.25
Steel axle turnings	8.50 to 8.75
No. 1 busheling	11.00 to 11.25
No. 1 railroad wrought	12.50 to 13.00
No. 1 cast	11.50 to 12.00
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—Several mill agencies are taking steel bar contracts at 1.35c. for the first quarter. Some plate and structural contracts are being booked for the same delivery at 1.40c. Other mills have not yet opened their books for delivery in the first quarter and may ask higher prices. Mills that are selling for 1913 are not soliciting business but are covering customers who want contracts. Considerable inquiry for contracts has come out. Specifications are heavy and the general situation regarding deliveries is unchanged. Eastern mills continue to get a fair volume of small orders for early delivery in this market at 1.45c. to 1.50c. at mill for plates and 1.40c. to 1.50c. for structural material, the freight being 19c. The only new structural contract reported is 200 tons taken by the Van Dorn Iron Works Company, Cleveland, for the Allyne-Ryan foundry in this city. The demand for iron bars is active and prices are firmer, 1.50c., Cleveland, now being the minimum quotation. Makers of hard steel bars have advanced prices \$1 a ton to 1.35c., Pittsburgh. The demand for concrete reinforcing purposes is heavy and mills are 60 to 90 days behind on deliveries. The sheet market is very firm at the new prices, but the new demand is not active. Forging billets are getting scarcer and are being sold by Eastern mills in this market at

\$32 to \$33, Pittsburgh. The demand for light rails is good and deliveries are slow.

The At Metal & Iron Company, Cleveland, has been incorporated with a capital stock of \$5000 by Philip Kalisky, J. Karp, Benjamin Karp, A. Fliedner and D. Zimmerman.

Cincinnati

CINCINNATI, OHIO, September 18, 1912.—(By Telegraph.)

Pig Iron.—A natural consequence of the recent heavy contracting is a let up in the inquiry as well as in the bookings. However, quite a number of melters in this territory, who were not covered for the first part of next year, quietly slipped in the market last week and it is understood that most of them were able to place their orders at prices prevailing at that time. Prices are firmer, and have sought a higher level both in the South and in the Ironton district. Although it is possible to purchase a very limited quantity of Southern No. 2 foundry slightly below No. 13, Birmingham, all of the Alabama furnaces have set that figure as minimum, while there are several who are asking \$13.50 for this year's delivery. This is also the asking price of the majority for first quarter shipment, as one large producer has advanced to \$14, Birmingham. Hanging Rock furnace operators have withdrawn all quotations below \$15, Ironton, for shipment the remainder of the year, but it is possible to contract for delivery through the first quarter at this price. The larger inquiries out include 5000 tons of pipe iron for first quarter from northern Ohio, and a melter in the same territory wants 500 tons of Northern No. 2 foundry. A central Ohio firm is asking for 2500 tons of special low phosphorus iron for first half. Among recent malleable sales is one to a Western melter totaling about 1000 tons for second quarter, and a central Ohio manufacturer contracted for 400 tons for first half. A local melter bought 400 tons of Northern No. 2 foundry for January-June shipment and other smaller orders have been booked by nearby consumers. A local firm reports the sale of 20,000 tons of pyrites cinders to a Western smelter. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	\$16.25 to \$16.75
Southern coke, No. 2 foundry and 2 soft	16.00 to 16.50
Southern coke, No. 3 foundry	15.50 to 15.75
Southern coke, No. 4 foundry	15.25 to 15.50
Southern gray forge	15.25 to 15.50
Ohio silvery, 8 per cent. silicon	17.70 to 18.20
Southern Ohio coke, No. 1	16.45 to 16.95
Southern Ohio coke, No. 2	16.20 to 16.70
Southern Ohio coke, No. 3	15.70 to 16.20
Southern Ohio malleable Bessemer	16.20
Basic, Northern	15.70 to 16.20
Standard Southern car wheel	25.75 to 26.00
Lake Superior charcoal	17.25

(By Mail)

Coke.—Prices on both furnace and foundry grades are hardening in all three of the larger producing fields. There is also much complaint from customers over delayed shipments on contracts. Cars are getting scarcer, and many coke users are compelled to accept shipments made in hopper-bottom cars that are hard to unload. Foundry coke is showing more activity, and quite a number of small contracts have been made lately; one local buyer signed up for 8000 tons to be shipped in the next 12 months. Furnace coke is quoted around \$2.25 to \$2.50 per net ton at oven in the Connellsville, Wise County and Pocahontas fields, and 72-hr. brands are bringing from \$2.75 to \$3, with only a small quantity available at the lower price. The shortage in labor is becoming more acute in all districts.

Finished Material.—Local warehouses, having stocks on hand, are obtaining advantageous prices on material required for immediate shipment, as mill deliveries are very slow. The local warehouse quotations on steel bars now range from 2c. to 2.05c., and on structural material from 2.05c. to 2.10c. and mill prices are 1.35c. Pittsburgh for steel bars and 1.40c. on structural material. Railroad track material is in excellent demand, and both black and galvanized sheets are also good sellers, with the problem of satisfactory deliveries a very vexing matter for both the mills and jobbers.

Old Material.—The market is gradually growing stronger. Quite a number of advances have been made that will average about 50c. a ton on nearly all grades of scrap iron. The outside demand for old material is showing considerable improvement, as the rolling mills are now making some good purchases. The minimum figures given below represent what buyers

are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton.	
Bundled sheet scrap	\$10.00 to \$10.50
Old iron rails	13.75 to 14.25
Relaying rails, 50 lb. and up.	21.75 to 22.75
Re-rolling steel rails	12.00 to 12.50
Melting steel rails	11.00 to 11.50
Old car wheels	13.00 to 13.50
Per Net Ton.	
No. 1 railroad wrought	\$11.50 to \$12.00
Cast borings	7.00 to 7.50
Steel turnings	7.75 to 8.25
No. 1 cast scrap	11.00 to 11.50
Burnt scrap	7.75 to 8.25
Old iron axles	17.75 to 18.25
Locomotive tires (smooth inside)	12.00 to 12.50
Pipes and flues	7.50 to 8.00
Malleable scrap	9.25 to 9.75
Railroad tank and sheet scrap	7.00 to 7.50

Birmingham

BIRMINGHAM, ALA., September 16, 1912.

Pig Iron.—Manufacturers have been selling iron at \$13.50, No. 2 foundry basis, for delivery in the first half of the coming year. Even \$14 has been sounded, and one or two small sales are said to have been made at that price. Inquiries are being received which indicate a need for a large amount of iron next year. One or two of the furnace companies in this district are behind in deliveries and others had to come to their assistance and ship some iron to well-known customers to tide over the delay. Low grade irons are in strong demand. Shipments on foreign orders have been started. At least 15,000 tons from this district will find its way to Italy in the next six months. The foreign business was accepted on a parity with domestic prices. One of the Southern iron companies is out of the market altogether, while two others are selling with care so as not to be overcrowded. The Alabama make in September will show an increase of more than 3500 tons over August. The Sloss-Sheffield Steel & Iron Company will blow in two furnaces in October. The Tennessee Coal, Iron & Railroad Company blew in one furnace this month and may be able to blow in a sixth at Ensley in the next 60 days. The Chattanooga Furnace Company will blow in a furnace this week. With the exception of one company, the Sloss-Sheffield, there is no accumulated iron in the Southern territory, and that company only reports 35,000 tons on hand. There is a steady reduction of the accumulation and by the end of the year the current make will have to be depended on altogether. The sales in the past week have been in small lots, but the aggregate is as good as might be expected. Quotations, f.o.b. cars Birmingham, are as follows:

No. 1 foundry and No. 1 soft	\$13.50 to \$14.00
No. 2 foundry and No. 2 soft	13.00 to 13.50
No. 3 foundry	12.75 to 13.00
No. 4 foundry	12.50
Gray forge	11.50 to 12.00
Basic	12.50 to 13.00
Charcoal	22.50

Cast-Iron Pipe.—The production of cast-iron pipe in the South is now greater than ever before. The Dimmick plant at North Birmingham is in operation. This plant belongs to the United States Cast Iron Pipe & Foundry Company and the largest sized pipe is manufactured there. Pipe prices show no change, 4-in. being quoted at \$25 per net ton. There has been a steady inflow of business and shipments are being made by the trainload, the use of coal cars to haul out the pipe interfering to a certain extent with the transportation problem in the coal fields. Contracts in hand and in sight for cast-iron pipe warrant the assertion that there will be steady operation of pipe plants for many months.

Coal and Coke.—It will be necessary to increase the output of coal in Alabama to meet the demand. Railroads have been unable to furnish proper transportation for the reason that up to a few days ago consumers have been objecting to receiving coal in gondolas and hopper bottom cars. Many of the regular coal cars have been used in handling pipe shipments, and this product goes such a distance that the car shortage lately has been felt. There is a better demand for coke, with the price ranging between \$3.25 and \$3.75 per net ton at oven. It is announced that consumers who at first objected to by-product oven coke have found it as good as that made in the bee-hive oven.

Steel.—There is continued activity in steel products in this section. The plants of the Tennessee Coal,

Iron & Railroad Company at Ensley and Bessemer and of the Southern Iron & Steel Company at Gadsden are working steadily and the demand is strong. There is a fairly good demand for rails, while the steel wire market is such as to warrant an operation of all departments at the mills. Reports have it that the American Steel & Wire Company will in the near future place its plant at Corey, near Birmingham, in condition for operation.

Old Material.—With activity noted in the pig iron market, there is a good feeling in old material. Dealers report a good demand, but prices not advancing as with pig iron. Prices quoted by dealers, per gross ton, f.o.b. cars, Birmingham yards, are unchanged as follows:

Wrought iron car axles	\$15.00 to \$16.00
Old steel axles	13.50 to 14.50
Old iron rails	13.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	9.00 to 9.50
No. 1 steel	9.50 to 10.00
Tram car wheels	10.00 to 10.50
Standard car wheels	10.50 to 11.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, Mo., September 16, 1912.

The buying movement continues unabated with the demand becoming so accentuated that some representatives are inclined to caution purchasers against making a runaway market.

Pig Iron.—Sales have included one of 6000 tons of Northern basic for delivery through January, another of 1000 tons of malleable for first quarter delivery, and a large number of 500-ton orders for first quarter, while the 50 and 100-ton orders have been almost innumerable. The inquiries during the week have included one for 10,000 tons of basic, two each for 1000 tons of malleable and a considerable number of 500-ton and smaller lots. The aggregate sales for the week will probably run close to 25,000 tons. Quotations are firm with every prospect of advances, according to advices to furnace representatives here. No. 2 Southern is \$13, Birmingham basis, for rest of the year and \$13.50 for first quarter, with no inclination to seek business for second quarter. In fact there is a distinct disposition to discourage buying for that period. Specifications of contracts for the most part are exceeding original estimates and advances in price and the car shortage are operating to make the demand for supplies very insistent.

Coke.—The coke market came to life as the result of the appearance in the market of a large smelting interest and contracts were closed for a total of 30,000 tons for delivery over the coming year. The contract covers both Virginia and Kentucky 48-hr. coke. The quotations for foundry coke are sharply advanced, with no protection guaranteed beyond October 1 on quotations. Some representatives are permitted to give only immediate acceptance quotations. By-product coke is quoted at \$4.50 to \$5 at oven, or \$5.70 to \$6.20 St. Louis, but there is comparatively little for sale here.

Finished Iron and Steel.—Track fastenings are in very good demand and firm at last quotations with expectations of an early advance. Deliveries continue to be spread still further. In light rails the coal interests are heavy buyers in comparatively small individual lots, while the lumber people have come in strongly, two companies purchasing about 1400 tons during the week and others smaller quantities. One lumber company also bought 500 tons of standard section rails. Advances in prices are expected soon in the light rail market. In structural material the large order of the week was 2200 tons for the Wabash Railroad shops at Decatur, Ill. Specifications for monthly allotments continue heavier than contract requirements. Shapes and plates have been advanced to 1.40c. Pittsburgh and bars to 1.35c. with intimations of further advances soon. Plates are almost impossible to get. The demand for bars is in line with that for structural material and the urging of shipments is becoming acute.

Old Material.—In the scrap market the same buoyancy continues that has been noted and a number of quotations were marked up during the week. There has been a specific demand for old car wheels from outside interests and this has also been true of heavy melting steel scrap, frogs, switches and guards, railroad wrought, tires, bushing and turnings. The only list out is from the Vandalia, which offers 2000 tons of scrap

steel rail. Relaying rails are in active demand and the situation generally is very strong. We quote dealers' prices f.o.b. St. Louis, as follows:

Per Gross Ton.	
Old iron rails	\$15.00 to \$15.50
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	15.50 to 16.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards cut apart	12.00 to 12.50

Per Net Ton.	
Iron fish plates	\$13.00 to \$13.50
Iron car axles	19.25 to 19.75
Steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.50 to 12.00
Railway springs	10.75 to 11.25
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	7.00 to 7.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.75 to 12.25
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	9.25 to 9.75
Machine shop turnings	8.00 to 8.50

San Francisco

SAN FRANCISCO, CAL., September 12, 1912.

Local merchants are now endeavoring to place contracts covering the last quarter, but in most lines find it impossible to get any heavy tonnage delivered much before the end of the year. Specifications on old contracts are coming out in large volume, and in many cases buyers are willing to pay a premium for early delivery. Distributive trade is holding up remarkably well in view of the heavy buying by consumers during the summer, and jobbers' stocks are already showing signs of depletion. It is expected that the market will be closely cleaned up by the end of the year, notwithstanding the tonnage already ordered.

Bars.—Business is limited by the inability of the mills to make prompt deliveries. A heavy tonnage is being booked, however, especially of reinforcing material, the demand for which is fully as large as last month. The distributive trade in soft steel bars shows no curtailment and prices are considerably higher. Stocks in merchants' hands are more or less broken, and only one or two firms have any considerable tonnage of foreign bars. Soft steel bars from store, San Francisco, are quoted at 2.55c. for jobbing lots, or 2.40c. for carloads, iron bars being 0.10c. lower.

Structural Material.—Last month's building record in San Francisco was \$1,950,502, compared with \$2,452,725 for July. A similar decrease is noted in other coast cities, though Los Angeles still shows a valuation of over \$3,000,000. The demand for structural steel, however, is keeping up fairly well. The American Bridge Company has taken a substantial tonnage on the coast recently, and is said to have the contract for the Insurance Exchange, about 1600 tons. The Llewellyn Iron Works will furnish about the same quantity for the Merchants' Fireproof Building Company's building at Los Angeles, and several new projects are expected to come up there shortly. Figures will probably be taken in a week or two on a 300-ton job in Oakland. The Vulcan Iron Works has a contract for about 150 tons for the Jackson Brewery, this city. A new seven-story hotel is planned at Sacramento. The pleasure resort of Ocean Park, near Los Angeles, which was burned recently, is to be rebuilt immediately, and will probably require a substantial tonnage. The letting of contracts for the larger Exposition buildings will begin about November 11, according to official announcement.

Rails.—Light rails are only moderately active, as some of the larger buyers are looking for second-hand material. The recent tonnage of standard sections ordered by coast interests is very satisfactory, several good individual orders having been placed, in addition to the usual run of small business. A few new projects are coming up, including both interurban and logging roads. Continued activity is noted in grooved rails and specials for street railroads. The Key Route is preparing to increase its mole facilities, and is starting work on a tunnel on its projected San José route. The Southern Pacific is preparing to extend its lines around San José, Cal., and the Willamette-Pacific Railroad Company has just been organized by Southern

Pacific interests to extend the Eugene-Coos Bay line to Eureka, Cal.

Sheets.—Specifications continue heavy, and some contracts are being placed for the coming quarter, though few mills are able to promise delivery. Arrivals of old contracts have been large, but few merchants are able to keep their stocks complete, the consuming demand being fully up to the recent average.

Plates.—The present movement is only moderate, with no single inquiries for very large quantities, though merchants' specifications are about normal. A heavy tonnage will be required within the next year for pipe and penstock construction in the several power developments now in progress, but these orders may not be placed for some time.

Merchant Pipe.—The small trade locally has been slightly curtailed in the last fortnight, though buying continues active through the interior. Specifications are fair, but merchants are more interested in getting deliveries than in placing new orders. The demand in the oil districts is slow to improve, though some waterworks inquiries are coming out. The town of Clatskanie, Ore., has let a general contract to the Portland Crushed Rock Company in which 24,000 ft. of 8-in. and 3200 ft. of 4-in. steel pipe will be required. Port Alberni, B. C., is taking figures on two miles of steel pipe and other waterworks supplies, and the San Francisco park commission has just taken figures on a lot of 1½ to 4-in. pipe.

Cast-Iron Pipe.—The Oxnard job will be refigured. Bids have just been taken for a fair tonnage at Los Angeles, and many orders are being taken in Oregon. A material increase in municipal buying is expected in the last quarter, as a number of projects are about ready for figuring.

Pig Iron.—Local business remains quiet, and the market is rather unsettled, owing to the recent large arrivals of foreign iron. Prices on Alabama iron are stiffening considerably in sympathy with the primary market, No. 2 foundry being quoted at \$23.10. English iron is quoted about as before, but some holders are becoming anxious to sell, and slight concessions could probably be obtained. Little if any Chinese pig iron is likely to arrive before the end of the year.

Old Material.—A marked revival in the demand for steel melting scrap is reported, sales for export of about 15,000 tons having been closed within the last fortnight. Prices have advanced sharply, and dealers report a continued good demand for shipment, with some local inquiries. Some new inquiries are also coming out for rerolling rails, and the demand for relaying rails is unusually heavy. Cast and wrought-iron scrap stand about as before. Prices are quoted as follows: Cast-iron scrap, per net ton, \$14; steel melting scrap, per gross ton, \$12.50; wrought scrap, per net ton, \$12 to \$15; rerolling rails, per net ton, \$11.

German Prices Still Advancing

BERLIN, September 5, 1912.

Advances in Bars, Bands and Wrought Pipe

The upward trend of prices continues. The report given out for Friday's trading on the Düsseldorf Exchange states that the favorable general position continues and that bar prices have further risen. English No. 3 foundry iron was quoted at 80 to 82 marks, against 78 to 80 previously; ordinary commercial bars of basic steel, 121 to 126 marks, against 120 to 125. The band mills have this week again raised the price of their specialty 2.50 marks, after having made an advance only a month or so ago. The Hoesch Works, Dortmund, one of the largest manufacturers of bars, has just given out its new price list, showing advances of 2 to 3 marks. The new prices range between 124 and 126 marks net. The export price of bars has risen to 120 marks, f.o.b. Yesterday the Tube Convention raised wrought pipe and boiler tubes by reducing rebates, equivalent to a rise of about 5 marks a ton. A report given to the press describes business as very good, the works being heavily employed on orders running three to four months ahead.

The Belgian market continues to report rising prices. At the end of last week all grades of plates for export were raised 1 to 2 shillings, f.o.b. Antwerp. A Brussels dispatch of last night says that the mills have raised iron bars for the home trade 2.50 francs and basic 2.50 to 5 francs. In French Lorraine wire nails have been raised 10 francs to 235 francs per metric ton (equal to 2.13c. per lb.). The pig iron market remains strong, and it is announced with apparent authority that the Pig Iron Syndicate will make an ad-

round advance in prices to compensate the furnaces for the high prices of foreign ores. It had been at first expected that only Luxemburg grades would be raised. The Syndicate will adopt its 1913 scale in about a month. Meanwhile it is said that the combination has raised the price of high grade pig iron on supplementary orders for 1912 delivery 2 marks.

An Unexpected Change in the Scrap Trade

It is now admitted that the price of scrap has recently fallen about 2 marks in the Rhenish-Westphalian district under very heavy sales. It is explained in the trade that this curious exception to the general tendency is due to the fact that the great establishments there are turning more and more to working molten iron into steel direct, thus dispensing with the employments of scrap in making open-hearth steel. As the yearly offerings of such material in that region amount to about 300,000 tons, it is growing rather difficult to find a market for it.

From the bar trade a further improvement is reported. After buying had been proceeding actively for some time for foreign account the home trade has now begun to buy briskly for 1913 delivery. Export orders also continue of extraordinary volume.

The Rhenish-Westphalian Beams Association has been prolonged to June 30, 1917; that is, until the end of the Steel Works Union's current contract.

The Aumetz-Friede Hüttenverein of Lorraine has just issued its annual report, showing net earnings of 9,834,000 marks, against 6,822,000 marks last year. The dividend is unchanged at 12 per cent., but this year is declared on a capital of 58,000,000 marks, against 36,700,000 last year.

British Market Excited

Pig Iron Now Over 68s. and 80s. Talked Of—Marked Advances in Bars and Sheets

(By Cable)

MIDDLESBROUGH, ENGLAND, September 18, 1912.

Iron and steel markets are very active and excited. Pig iron is rampant. Leading Glasgow houses are talking of 80s. for No. 3. Stocks of pig iron in Connals stores amount to 279,805 tons, against 283,906 tons last week. Inquiry is heavy for semi-finished steel but sellers are very reserved. Tin plates are much more active and galvanized sheets are booming. We quote as follows:

Cleveland pig iron warrants (closing Tuesday), 67s. 11d. against 65s. 5½d. one week ago.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 68s. 9d., against 65s. 9d. one week ago.

Steel sheet bars (Welsh) delivered at works in Swansea Valley £5 17s. 6d. for January-March delivery.

German 2-in. billets, f.o.b. Antwerp, 102s. 6d.

German basic steel bars, f.o.b. Antwerp, £6 4s., an advance of 2s. from last week.

Steel bars, export, f.o.b. Clyde, £7 15s. to £7 17s. 6d.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7 5s.

Steel ship plates, Scotch, delivered local yard, £8 2s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 15s., an advance of 5s. from last week.

Steel rails, export, f.o.b. works port, £6 7s. 6d. to £6 10s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 15s. 3d., an advance of 1½d. from last week.

(By Mail)

Forecast of the Present Market Excitement—Hope That American Sellers Will Adhere Strictly to Export Contracts

MIDDLESBROUGH, ENGLAND, September 6, 1912.

There has been no holding pig iron and prices have moved higher with wonderful regularity, with big business done daily. That much higher prices are bound to be registered is a foregone conclusion, and one of these days we may see whirling excitement, for the stock in public stores is quite a manageable quantity if cornering operations were resorted to, and if once these were initiated, the end would be disaster. There have been one or two whispers as to the favorable opportunity now presented for rigging the market, but there is no indication that anything of the kind is contemplated. Indeed, some of the big people have been clearing out, recent buying being mostly ragged outside speculation, and certain of the longest heads in the trade are now quietly awaiting the time when it will be reasonable to put out some short sales. Truth

to tell, however, this time does not loom in view just yet, for we are experiencing a genuine boom.

Germany will have to buy a lot of iron this autumn, for raw material there is quite as scarce as it is here, and trade is expanding without intermission. There can be no mistaking the anxiety of consumers to cover their needs well ahead, but their apprehensions leave sellers pretty cold, for the latter have booked up a lot of material already and do not feel in any hurry to fall on the necks of buyers. The Germans, for instance, recently put up their price of 2-in. billets from 100s. to 102s. 6d., having sold largely at the lower figure, but while making this advance they decline to quote at all for sheet bars, which with billets at 102s. 6d. should be worth about 102s. 6d., this indeed being the nominal price, for the Belgians will not sell.

Consumers are now very fidgety about the position, and Americans representing outside plants and who are making a circuit of the industrial center are received with open arms. Trial lots of 100 tons or so of special open-hearth blooms are booked easily and some five-figure lines have been put before makers of sheet bars and billets. Where British works can do the business they can get pretty well anything they like to ask in reason. One big Scotch consumer of sheet bars has just paid 120s. for 10,000 tons to a Lancashire works, and the seller has declined further business at the price.

There are indications that some recent American sellers are anything but pleased with their European contracts, for they find now that domestic trade has picked up so wonderfully, home demands at high prices have to be neglected for the sake of rolling for export at lower figures. Past years have brought some unpleasantness of this kind with English works, and history looks like repeating itself at this juncture, which would be extremely unfortunate seeing the scrupulous fairness with which the Stahlwerks Verband treat their customers. I hold no brief for the Germans, but in the steel trade here at all events they have certainly set up a very high standard of ethics and what is more they live up to it. The man who buys German steel knows he is going to get it down to the very last bar, with no quibbling or shilly-shallying, and the knowledge that this is so is an open sesame to the Verband's agents from one end of the country to the other.

New York

NEW YORK, September 18, 1912.

Pig Iron.—Not as much business is under consideration this week and the volume of sales is probably less than in the preceding week. A Connecticut foundry making a variety of castings placed 3500 tons of iron with analyses corresponding to No. 2 plain and No. 3, and at the same time bought 500 tons of special iron. The greater part of this business was presumably taken by Pennsylvania furnaces having a freight of \$2.30 into New England. Competition with Buffalo furnaces was close. The deliveries called for are in the first quarter of 1913. A Brooklyn foundry bought 1000 tons this week for the early months of next year and an inquiry for 1000 to 2000 tons for the second quarter has come up from a Connecticut manufacturer of machinery castings. The contracts placed through New York offices last week included business with radiator, valve, pump and railroad supply foundries. It would appear that large interests are not only well covered for 1912, but have the bulk of their first quarter requirements taken care of. It is noteworthy that while some sellers name a uniform price whether for delivery this year or in the first quarter, and even in the first half, of 1913, it is usual to ask 50 cents a ton more for delivery in 1913 than in the remainder of this year. Eastern Pennsylvania furnaces in particular preserve this differential, while a number of Buffalo furnaces which are well sold for 1912 ask as much for this year's delivery as for 1913. One Buffalo interest is quoting \$16 for No. 2-X for 1913, but some recent sales have been made in that district for New England delivery at prices figuring back to \$15.25 at furnace and in the latter part of last week as low as \$15 at furnace. Eastern Pennsylvania furnaces have been asking \$15.75 to \$16 for No. 2-X for this year's delivery, and some of them have advanced their prices for 1913 to \$16.50 at furnace. We quote as follows for Northern iron at tidewater: No. 1 foundry, \$16.75 to \$17; No. 2-X, \$16.25 to \$16.75; No. 2 plain, \$16 to \$16.25. Southern iron is quoted at \$17.50 to \$17.75 for No. 1 foundry and \$17.25 to \$17.50 for No. 2.

Structural Material.—Conditions remain unchanged, mills being crowded with orders, and yet nothing of particular moment in new inquiries arising. It seems clear that while the amount of business being sent to the mills is of good proportions the high percentage of operation

of the mills does not after all produce the expected output. Recent hot weather and scarcity of labor are mentioned as contributing factors. Sentiment accordingly continues strong, and while 1.40c., Pittsburgh, is generally spoken of as base, actual prices are anything from 1.40c. upward. The representatives of steel mills are apparently making no special effort to hunt business and are in some instances refusing to consider demands for 1913 account, particularly on open contracts, as distinguished from specific contracts, such as with general contractors or manufacturing plants. Prices from store are stiffer and show generally an advance of \$2 a ton. The early definiteness of some of the New York subway work is shown in the award this week of general contracts for a number of sections, and among the newer projects appearing is a garage in Long Island City requiring 2000 tons. The public tenders on the 8000-ton structure for the Eighth Coast Artillery Armory are to be offered by September 25. An apartment house, 120th street and Amsterdam avenue, requiring 500 to 600 tons, is to be erected by Milliken Brothers, and a mill building at Luke, Md., 300 tons, has been placed, it is understood, with the Berlin Construction Company. A 400-ton police station building in New York is also reported closed. The Boston & Maine is taking bids on a 250-ton bridge at Summerville, Mass. Plain structural material is quoted at 1.56c. to 1.61c., New York, and 2.15c. from store.

Iron and Steel Bars.—A sidelight on the demand for steel bars is shown in the advance by a leading maker of refined bar iron to 1.50c., base, New York, in carload lots, this advance of \$1 a ton being made about ten days after a similar advance. This places iron bars above the nominal quotation for steel bars of 1.30c., Pittsburgh, though no recent transactions at this figure could be learned of. The bar iron interests appear to take a similar attitude to steel makers in not wishing for an increase in the volume of orders, at least for some time. Considerable pressure is being brought to close for a portion of 1913 and a number of contracts are known to have been placed for 1.35c., Pittsburgh, for the first quarter for regular customers, but particularly those in the manufacturing class or having specific needs. A demand for 1.40c. for the second quarter was not accepted by one buyer. Quotations are as follows: Steel bars, 1.46c. to 1.51c., New York, and from store, 2c.; iron bars, 1.45c. to 1.50c., New York, and from store, 1.90c.

Steel Plates.—The activity of Eastern plate mills remains unabated, and following an advance of \$1 a ton made September 11 by one mill comes another advance by the same mill September 17 of \$1 additional, making sheared plates 1.50c., Pittsburgh, and universal, 1.55c. While the general quotation is 1.40c., Pittsburgh, it is believed that practically all of the new business, except with the leading interest for somewhat extended delivery, is done at the higher prices. Demand in the local market has not improved, and the business moving is the normal amount. There is a little present activity in car buying, but more credence is placed on the possibilities of the Pennsylvania and the New York Central both coming into the market because of calculated need of more cars. Among the car inquiries which are regarded as likely to close before long are the following: 300 to 500 box for the Lehigh & New England; 500 box for the Carolina, Clinchfield & Ohio; 1250 for the Missouri, Kansas & Texas; 1200 for the Kansas City Southern, and 1500 underframes for the Louisville & Nashville. Sheared plates are quoted at 1.56c. to 1.66c., New York, and universal plates at 1.61c. to 1.71c.

Old Material.—The demand appears to have abated to some extent. Brokers seem to be more interested in making purchases than the mills, having probably made short sales which they are now endeavoring to cover. Inquiries from steel works and rolling mills are comparatively light. Cast scrap continues to be the most neglected material in the list. Dealers' quotations per gross ton, New York and vicinity, are firm as follows:

Old girder and T rails for melting.....	\$12.00 to \$12.50
Heavy melting steel scrap.....	13.00 to 12.50
Relaying rails.....	21.50 to 22.00
Re-rolling rails.....	14.00 to 14.50
Iron car axles.....	21.00 to 22.00
Old steel car axles.....	15.50 to 16.00
No. 1 railroad wrought.....	13.75 to 14.25
Wrought iron track scrap.....	13.00 to 13.50
No. 1 yard wrought, long.....	12.50 to 13.00
No. 1 yard wrought, short.....	12.00 to 12.50
Light iron.....	5.25 to 5.50
Cast borings.....	7.75 to 8.00
Wrought turnings.....	8.75 to 9.00
Wrought pipe.....	11.50 to 12.00
Old car wheels.....	13.25 to 13.75
No. 1 heavy cast, broken up.....	11.50 to 12.00
Stove plate.....	9.00 to 9.25
Locomotive grate bars.....	9.00 to 9.25
Malleable cast.....	10.00 to 10.50

Cast Iron Pipe.—No public lettings of importance are in sight in this immediate vicinity. Private buyers continue to feel the market for delivery next year, but so far have found very few pipe makers willing to consider contracts of this character. Small sizes are now hard to get for prompt shipment. Carload lots of 6 in. are quoted at \$23.50 to \$24 per net ton, tidewater.

Ferroalloys.—Quotations for 80 per cent. ferromanganese, forward delivery, range from \$56.50 to \$57, Baltimore, and the tendency is upward. For delivery to the end of this year \$59 to \$60 is the range quoted. Since the price was \$53.50 a large quantity, stated to be over 2000 tons, was sold on the rise of the market. There are pending requirements of at least 2000 tons, which includes about 300 tons of spot. Spot ferromanganese is scarce, and some dealers have such confidence in its future strength that they are holding for \$65. The range of prices is greater than usual. Ferrosilicon, while in no special demand, is higher at \$75, Pittsburgh, for carload lots, prices for 100 tons and over ranging lower.

Buffalo

BUFFALO, N. Y., September 17, 1912.

Pig Iron.—The market is very strong, with heavy demand for 1913 requirements. Some furnaces have taken on business for first half until they are booked to cover a large proportion of their capacity for that period. Prices have advanced sharply during the past week. Announcement has been made by some producers that their minimum prices at furnace are now \$16.25 for No. 1 foundry; \$16 for 2 X foundry and malleable; \$15.75 for No. 2 plain and \$15.50 for No. 3 foundry and gray forge. The tonnage booked for the week will aggregate 55,000 to 60,000 tons, foundry grades and malleable, for first quarter and half delivery, with a considerable tonnage under negotiation. The rise in price has checked, temporarily at least, the placing of new contracts, which seems to be in accordance with producers' desires. Considerable difficulty is being experienced in the matter of car supply, accentuated to some extent by the break in the Erie Canal, which temporarily places an embargo on canal shipments. For remainder of year and first and second quarter we quote as follows, f.o.b. Buffalo:

No. 1 foundry.....	\$16.00 to \$16.25
No. 2 X foundry.....	15.75 to 16.00
No. 2 plain.....	15.50 to 15.75
No. 3 foundry.....	15.50
Gray forge.....	15.50
Malleable.....	15.75 to 16.00
Basic.....	15.75 to 16.25
Charcoal, according to brand and analysis.....	17.00 to 18.00
Charcoal, special brand and analysis.....	20.00 to 21.50

Finished Iron and Steel.—Very active conditions continue with price tendencies swinging higher. Specification for the week has been very heavy, one interest reporting that general specifying was the largest of any week this year. All mills are now in such shape with excess specifications that they have practically withdrawn from the market so far as new business for the remainder of the year is concerned. Some mill interests have opened their books for first quarter business, contracts to be limited strictly to first quarter requirements. For such delivery prices have been advanced \$1 per ton, making bars 1.35c., Pittsburgh base, and plates and structural angles 1.45c., Pittsburgh base. Warehouse prices have been advanced \$2 per ton, making price on bars 2.05c. to 2.15c., Buffalo, for carload and less than carload and 2.10c. to 2.20c., Buffalo, on plates and structural, a difference of \$11 to \$12 per ton over mill prices. Warehouse prices are now higher than at any time since 1902 and there are several instances of large tonnages of structural material being placed for shipment from warehouse at prices representing an advance equal to \$12 to \$15 per ton over mill prices. There has been a further advance in railroad spikes to \$1.80, base Pittsburgh, most producers being entirely sold up for this year's delivery. Last week's advance in black and galvanized sheets has not checked demand, which is exceedingly active. In structural material demand remains active and a good many contracts are being held because of inability to secure deliveries during the remainder of the year and it will undoubtedly be necessary to carry a good many large building projects over until next Spring. Contracts now being taken are chiefly for buildings to be erected after March 1. Architects Esenwein & Johnson are receiving bids for steel for the Buckingham apartment house addition, 150 tons. The Charles F. Ernst Sons Iron Works, Buffalo, have received contract for the Main Street Realty Company's building at Main and Best streets, 100 tons, and the Buffalo Structural Steel

Company will erect three steel structure factory buildings for Clark Bros. & Co. at Olean, 150 tons; the Progressive Steel Company, Buffalo, will erect the Riverside Methodist Church, Buffalo, 150 tons, and the Syracuse Bridge Company, the Syracuse Savings Bank Building, 160 tons. The Eastern Concrete Steel Company, Buffalo, is low bidder on general contract for the Hippodrome Theatre, Buffalo, taking 500 tons of steel.

Old Material.—The week has shown increased activity in most lines, both from mills and foundries, and prices have advanced. The increase in price of pig iron and finished iron and steel products is apparently having some effect in fixing dealers' values of scrap materials. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$13.75 to \$14.00
Low phosphorus steel	16.25 to 17.00
No. 1 railroad wrought	13.75 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.25
Old steel axles	16.00 to 16.75
Old iron axles	23.00 to 23.75
Old car wheels	14.50 to 15.00
Railroad malleable	13.00 to 13.25
Boiler plate, sheared	14.50 to 15.00
Locomotive grate bars	11.50 to 12.00
Wrought pipe	10.00 to 10.50
Tank iron	10.50 to 10.75
Wrought iron and soft steel turnings	8.25 to 8.75
Clean cast borings	7.50 to 8.00

Boston

BOSTON, MASS., September 17, 1912.

Old Material.—The market is steady, with no changes in prices. The mills are experiencing what the dealers term congestion, which is retarding to some extent the movement of material, but the influence is taken to be temporary. The quotations given below are of prices offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$11.75 to \$12.00
Low phosphorus steel	13.50 to 14.00
Old steel axles	14.50 to 15.00
Old iron axles	22.00 to 22.50
Mixed shafting	13.50 to 14.00
No. 1 wrought and soft steel	11.50 to 11.75
Skeleton (bundled)	10.00 to 10.50
Wrought iron pipe	10.00 to 10.25
Cotton ties (bundled)	10.00 to 10.25
No. 2 light	4.50 to 5.00
Wrought turnings	8.00 to 8.50
Cast borings	7.25 to 7.50
Machinery, cast	12.50 to 13.00
Malleable	10.00 to 10.50
Grate bars	7.75 to 8.00
Stove plate	8.50 to 9.00
Cast-iron car wheels	12.50 to 13.00

Metal Market

NEW YORK, September 18, 1912.

The Week's Prices

		Copper, New York.				Lead		Spelter	
		Sept.	Lake.	Electro-lytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
12.....	17.75	17.62½	48.90	5.10	4.95	7.45	7.30		
13.....	17.75	17.62½	49.25	5.10	4.95	7.50	7.35		
14.....	17.75	17.62½	49.25	5.10	4.95	7.50	7.35		
16.....	17.75	17.62½	49.55	5.10	4.95	7.55	7.40		
17.....	17.75	17.62½	48.60	5.10	4.95	7.60	7.45		
18.....	17.75	17.62½	49.00	5.10	4.95	7.60	7.45		

Copper is quiet but firm. Tin, following some good buying, is quiet at high prices. Lead is not so strong, though prices of principal sellers are unchanged. Spelter is higher. All grades of antimony have advanced.

New York

Copper.—Conditions in the copper market are practically unchanged, the week having been quiet, in fact dull, but continuously firm. A small quantity of Lake was disposed of in the week at slightly below the price of 17.75c. cash, New York, but not enough to fix the market price. What business there has been was chiefly in Lake for delivery on to November. Very little resale copper is in evidence. For electrolytic 17.62½c. cash, New York, may be quoted as the bottom price, although there has been buying in small lots to meet urgent needs at 17.65c. cash, New York. Generally, consumers are comfortably supplied for the time being. The price of copper in London to-day is £78 3s. 9d. for spot and £79 3s. 9d. for futures. The exports of copper this month have been under normal, totaling but 13,624 tons.

Pig Tin.—On September 14 a big business was done in tin in the local market, at least 500 to 600 tons having

been sold, nearly all for future delivery, and report had it that the United States Steel Corporation was a heavy buyer. While this is not confirmed it is believed in many quarters to be a fact. On September 16 there was a sharp advance in London as an aftermath of the buying in this market and the rise was followed September 18 by a decline of £4 10s. It is assumed that the advance resulted from a desire to profit by an awakened demand here, but if that was the case it was a signal failure as buyers did not follow on the rise and the decline also failed to stimulate buying. The favorable statistics are generally credited with the strong position of tin, the consumption of which continues very good. On the other hand, there cannot be said to be any scarcity of the metal as approximately 4500 tons will be available for American consumption this month. The arrivals in September have been 2890 tons and there is afloat 2150 tons. Spot tin is quoted in London to-day at £223 5s. and futures at £220 5s. On September 16 spot tin in London went as high as £227 10s., closing at £226 10s. September 17 it was down to £222, to-day's price therefore showing a recovery of £1 5s. The price in New York to-day is 49c.

Tin Plates.—There is little change in the tin plate situation, the demand continuing at full flood and the mills not offering to undertake any contracts for the first quarter of 1913. There is a feeling that a still further advance is highly probable.

Lead.—The price situation in lead is somewhat contradictory for the reason that while the leading interest is adhering to 5.10c., New York, an outside seller has sold at 5c., New York, for September and October delivery. In the West, where 4.95c. is quoted as the ruling price, sales of special brands have been made at 5c., St. Louis. While the market cannot be said to be weak, it certainly is not as strong as it was a week ago, although it is still under the influence of foreign conditions.

Spelter.—There has been a uniform advance in spelter throughout the week and to-day 7.60c., New York, and 7.45c., St. Louis, is quoted as the price. The principal feature in the metal is the heavy deliveries on old contracts while new buying is not especially heavy.

Antimony.—The demand for antimony, including all brands, has been very good and prices have advanced in the more active market. Cookson's is now quoted at 8.75c., Hallett's at 8.30c. and Chinese and Hungarian grades at 8.12½c.

Old Metals.—The good demand continues and dealers have advanced their selling quotations as follows:

	Cents per lb.
Copper, heavy and crucible	16.50 to 16.75
Copper, heavy and wire	16.25 to 16.50
Copper, light and bottoms	14.25 to 14.50
Brass, heavy	10.25 to 10.50
Brass, light	8.25 to 8.50
Heavy machine composition	13.00 to 13.25
Clean brass turnings	9.50 to 9.75
Composition turnings	12.00 to 12.50
Lead, heavy	4.75
Lead, tea	4.50
Zinc scrap	5.75

Chicago

SEPTEMBER 17.—While the week witnessed considerable buying of copper, prices show no change. The development of a shortage in tin, together with some reported manipulation of the supply, brought about a sharp advance in this metal. Spelter quotations are higher and new prices for zinc are announced. We quote as follows: Casting copper, 17.50c.; Lake, 17.87½c. to 18c., in carloads for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 50½c.; small lots, 52½c.; lead, desilverized, 5c. to 5.05c. for 50-ton lots; corroding, 5.25c. to 5.30c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 7.35c. to 7.50c.; Cookson's antimony, 9c., and other grades, 8.50c. in small lots; sheet zinc is \$8.90 f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 14.75c.; copper bottoms, 13c.; copper clips, 14c.; red brass, 12c.; yellow brass, 9.25c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 28.50c.; tinfoil, 33c.; block tin pipe, 40c.

St. Louis

SEPTEMBER 16.—The metal market has been moving steadily upward with the result that lead is quotable at 5.02½c.; spelter, 7.25c. to 7.30c.; Lake copper, 17.97½c. to 18.10c.; electrolytic, 17.85c. to 18.10c.; tin, 49.37½c. to 49.60c., and Cookson's antimony, 8.05c. to 9.10c. The demand has been good. In the Joplin ore market there was another sharp increase in the price of zinc blende,

with the result that the basis price ranged from \$58 to \$62 per ton for 60 per cent., with the choicest lots selling for \$65. This is an advance of \$3.50 for the week and \$16 higher than for the corresponding week in 1911. Calamine sold for \$30 to \$32, 40 per cent. basis, with the best lots going at \$36. Lead ore found a ready market at \$61 to \$62, 80 per cent. basis, with the choicer lots bringing \$64. On miscellaneous scrap metals we quote as follows: Light brass, 5.50c.; heavy brass and light copper, 9.50c.; heavy copper and copper wire, 10.50c.; pewter, 21c.; tin foil, 31c.; zinc, 3.50c.; lead, 3.50c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, September 18, 1912.

While the stock market has been rather dull prices have quite uniformly maintained strength. Some securities, such as the Can stocks, have made good advances. Westinghouse Electric common dropped sharply on Tuesday after the declaration of a dividend. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Bald. Loco., com...	58½-59½	Pressed Steel, com...	36½-37½
Bald. Loco., pref...	106-106½	Pressed Steel, pref...	102½
Beth. Steel, com...	39½-41	Railway Spring, com...	36½-37½
Beth. Steel, pref...	70-72	Railway Spring, pref...	102
Can, com...	38½-41½	Republic, com...	26½-29
Can, pref...	119½-121½	Republic, pref...	87-90
Car & Fdry., com...	59-60½	Sloss, com...	55-56½
Car & Fdry., pref...	119½	Pipe, com...	19½-20½
Steel Foundries...	37-37½	Pipe, pref...	59½-60
Colorado Fuel...	33½-36½	U. S. Steel, com...	71½-73½
General Electric...	179-182½	U. S. Steel, pref...	112½-113½
Gr. N. Ore. Cert...	44½-46½	West'hse El., com...	86-88½
Int. Harv., com...	124-126½	Va. I. C. & Coke...	62½-65
Int. Harv., pref...	119	Am. Ship, com...	55-59½
Int. Pump, com...	26½-27½	Chic. Pne. Tool...	52½
Int. Pump, pref...	80-81	Cambria Steel...	47-48½
Locomotive, com...	42½-44½	Lake Sup. Corp...	34-34½
Locomotive, pref...	109½	Pa. Steel, pref...	99
Nat. En. & St., com...	17-18	Crucible Steel, com...	17½-18
Nat. En. & St., pref...	90	Crucible Steel, pref...	96-96½
Pittsburgh Steel, pref...	102		

Pittsburgh and Vicinity Business Notes

The Fort Pitt Steel Casting Company, McKeesport, Pa., will remodel its present cleaning department and is erecting a new building of larger size to contain it. The capacity of the plant is being increased and the company is now in position to take on the manufacture of some specialties which heretofore it has not been able to handle.

G. W. McClure, Sons & Co., engineers and contractors, Bessemer Building, Pittsburgh, controlling the McClure three pass hot blast fire brick stoves, have received a contract for eight 22 x 100 ft. stoves of this type, which will be installed at the two blast furnaces being erected by the Pittsburgh Steel Company, Monessen, Pa. The firm also has an order for 10 stoves of this type, 22 ft. 6 in. x 100 ft., to be installed at the new blast furnaces of the Minnesota Steel Company, Duluth, Minn., and is building one of these stoves, 21 x 100 ft., at the blast furnace of the Pittsburgh Crucible Steel Company, Midland, Pa.

The August business of the Westinghouse Machine Company, East Pittsburgh, amounted to about \$700,000, being the largest for any one month since October, 1910.

The Pressed Steel Truck Company, Sharon, Pa., recently organized, has received its charter. The president is J. L. Considine and the secretary and treasurer is J. P. Sweeney. The plant will be located on ground now owned by the Petroleum Iron Works Company. The main building will be 50 x 400 ft., and the pickling and galvanizing department 50 x 175 ft. The equipment, all of which has been purchased, will consist of tools and presses suitable for use on sheet metal work. The company expects to have its plant in operation by the first of the year.

The Sharon Iron & Metal Company, Sharon, Pa., has increased its capital stock to \$100,000 and will expend \$15,000 in making improvements.

Tate-Jones & Co., Inc., Pittsburgh, have made some very successful installations of fuel oil burners under galvanizing kettles, fuel oil being an ideal fuel for this work, as by its use the temperatures can be very closely regulated. The Brier Hill Steel Company, Youngstown, Ohio, has just placed an order, for a complete Tate-Jones oil burning installation under seven galvanizing kettles.

While the Carnegie Steel Company contemplates making extensive improvements and large additions to its

plants at Sharon, Farrell and New Castle, Pa., nothing definite has yet been worked out. It is not likely that the plans will be fully matured before the end of the year.

The stockholders of the Carbon Steel Company, Pittsburgh, will meet September 24, to consider the adoption of a resolution to reduce the authorized capital stock from 50,000 shares of \$100 each to 15,000 shares of \$100 each, all of uniform or common stock, so that the authorized capital shall hereafter be \$1,500,000 instead of \$5,000,000, and to increase the indebtedness from \$700,000 to \$2,000,000, secured by bond and mortgages on the property of the company.

Work has started on the building of two 60-ton basic open hearth furnaces at the Clairton works of the Carnegie Steel Company, which will make a total of 12 furnaces of this size in that plant. The additional furnaces are necessary to balance the finishing capacity of the plant.

Contracts have been let with A. P. Dixon, Martins Ferry, Ohio, for the foundations for the new tin plate plant of the Wheeling Sheet & Tin Plate Company to be built near Wheeling, W. Va. The contract for the cranes, consisting of four 20 and one five-ton, and also for the 10 hot mills and 12 cold mills will likely be placed this week. The contract for the cranes has been delayed somewhat because of the higher prices now being asked by the builders of cranes.

The blast furnace of the Sharpsville Furnace Company at Sharpsville, Pa., which has been idle for three years or longer, may resume blast within the next two weeks. This is a small stack, making from 150 to 175 tons of iron per day.

Union molders employed in the plants of the Shenango Machine Company, Sharon, Pa., and the Sharon Foundry Company, Wheatland, Pa., have made a demand for an increase in the minimum wage from \$3.35 to \$3.75 per day.

The foundries and machine shops of the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, are running to full capacity. A great deal of work has been booked. Contracts now being executed include power plant equipment for the Virginia Railway & Light Company, Richmond, Va.; steel gate valves and check valves for the Lehigh Navigation & Electric Company, Haute, Pa.; tunnel heating lines for tank and tender shops of the Canadian Locomotive Company, Kingston, Ontario; boiler feed and blow-off lines for the Brooklyn plant of the American Sugar Refining Company, the steam piping for which has just been completed in the valve company's shops; steam and exhaust lines for two low pressure turbines and furnace bosh piping for the Algoma Steel Company, Sault Ste. Marie; cast steel gate valves for the new power plant of the Republic Railways & Light Company, Lowellville, Ohio; three 48-in. motor operated gate valves and special castings for the Georgia Railways & Light Company; 24 20-in. bowl gate valves and 72 24-in. sluice gates for the city of Pittsburgh (Duquesne Contracting Company); remodeling heating system and power plant for the Carnegie Institute of Technology, Pittsburgh, as made necessary by building changes; 24-in. and 36-in. gate valves and fittings for the new gasholder of the Allegheny Heating Company (Philadelphia Company), Pittsburgh; gas line gate valves, fittings and regulating connectors to a number of natural gas companies in various States.

The Southern Aluminum Company of New York was incorporated at Albany, September 11, with a capital stock of \$6,000,000 to operate in North Carolina. The directors are: Adrien Baden, Leon Bartholin, George Berge, Hippolyte Bouchayor, Henry Brunner, Charles Dubreuilh, Jules Dreyfus and Charles Michel-Cote of Paris; Hubert Chalmeton de Croy of Lovret, France; Henry Gall of Versailles, France; Jean Sonnerly Martin and Lazare Wolf of Lyons, France; Zachary Hochschild of Frankfurt-sur-le-Mein, Germany; Dr. Paul Héroult of New York. The company is chartered to manufacture aluminum and its by-products.

The Pacific Coast Steel Company, San Francisco, Cal., has placed an order with Tate-Jones & Co., Inc., Pittsburgh, Pa., for oil burning equipment for an open hearth furnace. This is the second furnace that the company has supplied with Tate-Jones equipment.

Annual Gathering of Foundry Interests

What the Meetings and Exhibition Next Week in Buffalo, N. Y., Have in Store for Those Engaged in the Foundry Industry

This year's meetings of founders in iron, steel and nonferrous metals and the exhibition of foundry machinery, equipment, accessories and supplies will be held in Buffalo, N. Y., for practically the entire week beginning Monday, September 23. Advance copies of the programmes of the sessions of both the American Foundrymen's Association and the American Institute of Metals (formerly the American Brass Founders' Association) and an advance compilation of exhibitors and exhibits, all of which information is printed below, promise to make next week's gathering of foundry interests fully as profitable, commercially and educationally, as in former years. When it was decided last year, in the meetings in Pittsburgh, to hold the 1912 conventions in Buffalo, considerable doubt was expressed that the universally popular feature of the gathering, the exhibition, could well be accommodated. Through the arrangements made by the Foundry & Machine Exhibition Company, an incorporation of manufacturers which manages the exhibit features, it appears that no trouble will be occasioned in this regard. A little more than usual interest lies in the fact that the Pittsburgh foundry week occurred in the latter part of May, so that the Buffalo week may be counted on as bringing out points of progress made in the last sixteen months. Besides the associations of founders and the exhibition it is proper to add that another one of the annual meetings to be held at the same time is that of the Associated Foundry Foremen, the headquarters of which will be at the Broeze House, Buffalo. Immediately following will be found the programmes of the two technical associations and then will be given the list of exhibits. This *The Iron Age* has compiled to give an idea of what may be expected in the way of new and standard productions arranged for convenient examination and study.

Programme of the American Foundrymen's Association

The programme of the meetings of the American Foundrymen's Association, as obtained from Dr. Richard Moldenke, Watchung, N. J., secretary, is given in the subjoined tabulation. The headquarters and meeting place of the association will be in the Statler Hotel and the gathering will be the seventeenth convention:

Tuesday, September 24, 10 A. M.

Addresses of welcome and responses.
Address of the president.
Report of the secretary-treasurer.
Report on cast iron at the International Congress for Testing Materials at New York.
Report of the committee on coke analysis.
Report of the committee on industrial education.

Tuesday, September 24, 2 P. M.

Malleable Cast Iron and the Open-Hearth Furnace, by G. A. Blume, Stockholm, Sweden.
Memorandum on Titanium in Malleable Castings Practice, by C. H. Gale, Pittsburgh, Pa.
The Great Economies Produced by Continuous Foundry Installations, by Geo. K. Hooper, New York City.
The Foundry and the Pig Iron Market, by A. I. Findley, Editor, *The Iron Age*, New York City.
Mechanical Sand Tempering, by V. E. Minich, New York City.
Compressed Air—A Foundry Necessity, by Arthur F. Murray, East Cambridge, Mass.
The Heating and Ventilating of the Foundry, by W. H. Carrier, Buffalo, N. Y.
Melting Scrap, by A. W. Meyer, New York City.
Some Thoughts on the Problem of the Foundry, by C. F. Dudley, North Tonawanda, N. Y.
(The ladies will be taken to East Aurora to visit the Roycroft shops. The Associated Foundry Foremen's banquet is scheduled for the evening.)

Wednesday, September 25, 10 A. M.

Electric Welding, by J. F. Lincoln, Cleveland, Ohio.
The Electric Furnace in the Foundry, F. T. Snyder, Chicago, Ill.
The Economic Side of the Twelve Hour Shift in the Steel Foundry, by R. A. Bull, Granite City, Ill.
Some Salient Points of the Modern Steel Foundry, by Samuel R. Robinson, Coraopolis, Pa.
Open-Hearth Design and Manipulation, as Applied to the Steel Foundry, by John Ploehn, Davenport, Ia.
Economical Cleaning of Castings, by B. H. Reddy, Cleveland, Ohio.
The Effect of Titanium on Converter and Open-Hearth Steel Castings, by Prof. Bradley Stoughton, New York City.

Discussion on the Revised Specifications for Steel Castings of the American Society for Testing Materials.
The Bonus System as Applied to the Finishing Department of a Steel Foundry, by A. W. Gregg, S. Milwaukee, Wis.
The Detachable Open-Hearth Furnace, by W. M. Carr, Wheeling, W. Va.
(Lake trip on the "Eastern States" in the afternoon.)

Thursday, September 26, 10 A. M.

Lighting Fires in Cupolas, by A. H. Stein, Brooklyn, N. Y.
Mystery versus Chemistry in Grading Pig Iron, by Thos. D. West, Cleveland, Ohio.
Notes on Close-Grained Soft Cast Iron, by Dr. John J. Porter, Staunton, Va.
Air Required for Combustion in the Cupola, and a Simple Blast Gauge, by P. Munnoch.
Government Cupola Melting Tests, by A. W. Belden, Pittsburgh, Pa.
Rational Cupola Melting, by Dr. Richard Moldenke, Watchung, N. J.
Accident Prevention and Safety Devices for the Foundry, by W. H. Cameron, Chicago, Ill.
Instruction in Foundry Practice at the Wentworth Institute, by Prof. E. A. Johnson, Boston, Mass.

Thursday, September 26, 2 P. M.

On Patternmaking, by James Glass, Pittsfield, Mass.
Recovery of Shot in Small Foundries, by S. A. Capron, Westfield, Mass.
About Sheradizing, by Thos. Liggett, Jr., New Castle, Pa.
Some Short Cuts in the Foundry Laboratory, by P. A. Boeck, Worcester, Mass.
The Importance of Despatching in the Foundry, by C. E. Knoepfel, La Porte, Ind.
Discussion of the Molding Sand Tests of the Association. Unfinished and new business. Adjournment.
(In addition to the above programme of papers, several more have been promised, titles for which are not at hand at this printing. Moreover, many of the papers listed are illustrated by lantern slides. On Thursday afternoon, the ladies will be taken through the works of the Larkin Company. Subscription banquet on Thursday evening.)

Programme of the American Institute of Metals

The American Institute of Metals, W. M. Corse, Lumen Bearing Company, Buffalo, N. Y., secretary, has established headquarters in the Iroquois Hotel. The advance copy of the programme is as follows:

Tuesday, September 24, 2 P. M.

Official Chemists' Report, by A. D. Little, Inc.
History and Achievements of the Institute of Metals (British), by G. Shaw Scott.
Work of the Bureau of Mines as it Relates to the Non-ferrous Metal Industry, by Prof. C. L. Parsons.
Miscellaneous business.

Wednesday, September 25, 9.30 A. M.

The Electric Furnace for Melting Non-ferrous Metals, by G. H. Clamer and Dr. Carl Hering.
Electric Melting of Copper and Brass, by C. A. Hansen.
The Successful Handling of Manganese Bronze and Other Alloys in a Reverberatory Furnace, for Foundry Tests and Foundry Practice, by W. R. Dean.
The Vaporization of Metals, by Dr. J. W. Richards.

Thursday, September 26, 9.30 A. M.

The Thermal Diagram with Special Reference to the Bronzes, by Dr. W. E. Campbell.
Progress of Work on Boron Suboxide as Used as a Deoxidizer in Non-ferrous Metals, by Dr. E. Weintraub.
Test Bars for Non-ferrous Alloys, by Jesse L. Jones.
Phenomena Connected with the Tarnishing of Metals, by Prof. C. F. Burgess.
The Influence of Pouring Temperature on Manganese Bronze, by H. W. Gillett.
Adulterated Core Flours, by H. W. Gillett.
Metallic Cobalt, by Herbert T. Kalmus.

Friday, September 27, 9.30 A. M.

The Difficult Art of Casting German Silver, by C. P. Karr.
Commercial Alloys and the Use of Rare Elements, by Dr. A. Hirsch.
Election of officers.

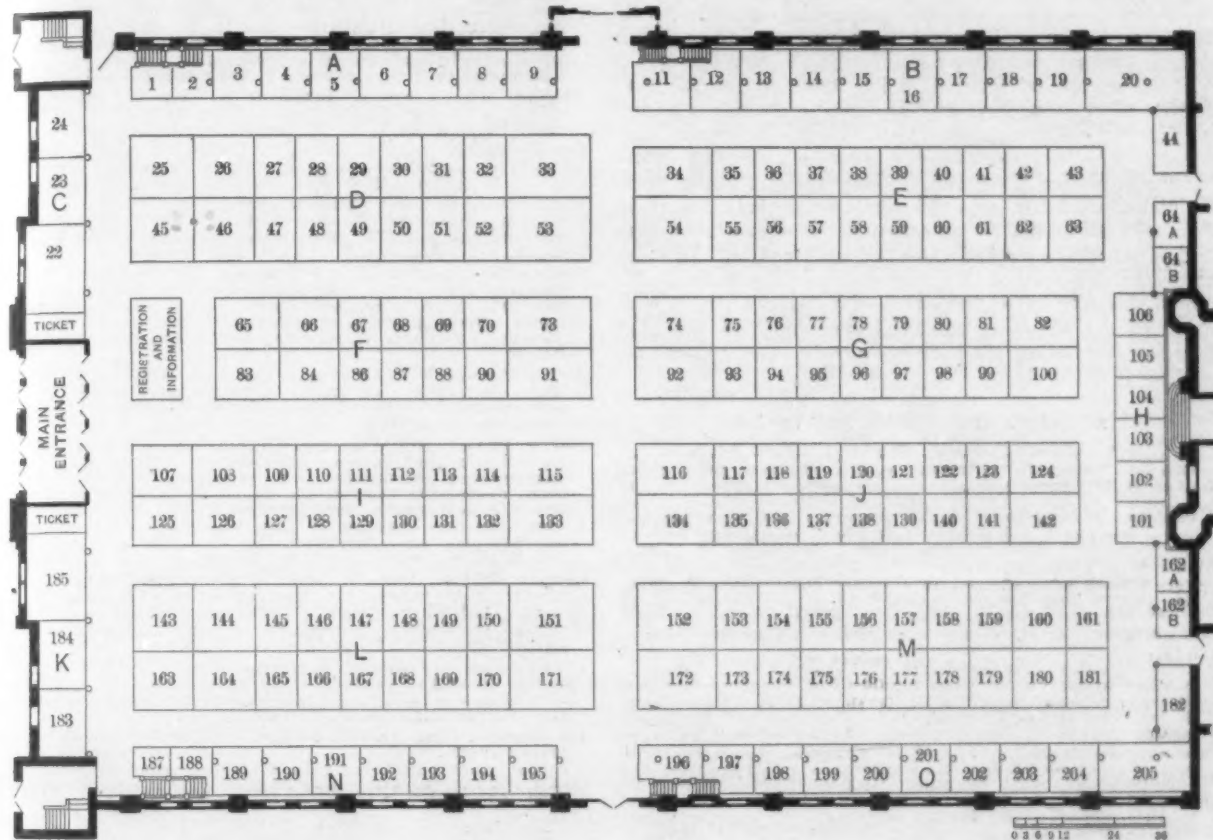
The Exhibition of Foundry Equipment

The exposition of the Foundry & Machine Exhibition Company is to occupy the 47,000 sq. ft. of floor area of the Broadway Arsenal or Exposition Building on Broadway, Buffalo. The efforts of C. E. Hoyt, secretary of the exhibition company, and his associates, backed by the experience of previous years, have brought together an imposing array of foundry machinery, equipment, supplies and accessories, which will serve admirably to illustrate the present status of foundry practice. Many of the exhibits have never been shown before in public and a large number of machines will be shown in motion, many

under actual working conditions. For their operation compressed air and both direct and alternating electric current have been provided.

The exposition building is only a short distance from the principal hotels. It is well adapted for an exhibition of machinery and heavy products as its flooring is of

wood laid on concrete which rests directly on the ground, thereby minimizing vibration and much of the noise and possible danger from overweighting floors. The floor space is 176 by 275 ft. and devoid of columns, save for a row of posts, 8 ft. 6 in. from the walls, which posts support a balcony.



American Vanadium Co. Pittsburgh, Pa. I-126
 Arcade Mfg. Co. Freeport, Ill. E-34-42 & 54-62
 Autocall Co. Shelby, Ohio. A-1-2
 Automatic Transportation Co. Buffalo, N. Y. J-140
 Baird & West. Detroit, Mich. K-185
 Jonathan Bartley Crucible Co. Trenton, N. J. O-199
 Bennett-O'Connell Co. Chicago, Ill. J-135
 Berkshire Mfg. Co. Cleveland, Ohio. O-197-8
 Buffalo Foundry & Machine Co. Buffalo, N. Y. 161
 Chas. H. Besly & Co. Chicago, Ill. L-151-170-171
 S. Birkenstein & Sons. Chicago, Ill. G-95-96
 Blystone Machinery Co. Cambridge Springs, Pa. G-77
 Brady Foundry Co., Jas. A. Chicago, Ill. J-141
 Brown Specialty Machinery Co. Chicago, Ill. J-117
 A. Buch's Sons Co. Elizabethtown, Pa. M-152-3-4
 Buckeye Products Co. Cincinnati, Ohio. F-90
 Buffalo Forge Co. Buffalo, N. Y. O-201-202
 Buffalo Scale Co. Buffalo, N. Y. F-66
 Canadian Foundryman. Toronto, Ont. I-128
 Carborundum Co. Niagara Falls, N. Y. M-160-1-2
 Castings. Cleveland, Ohio. F-86
 Chicago Pneumatic Tool Co. Chicago, Ill. O-203-4
 Cleveland Pneumatic Tool Co. Cleveland, Ohio. D-33
 Cleveland Wire Spring Co. Cleveland, Ohio. D-45
 Crawford Oil & Chemical Co. Cleveland, Ohio. F-67
 Curtis & Co. Mfg. Co. St. Louis, Mo. E-44-64
 Dalton Adding Machine Co. Buffalo, N. Y. J-118-119
 Davenport Machine & Foundry Co. Davenport, Iowa. D-27-30
 Delevan Mfg. Co. Brooklyn, N. Y. A-5
 Detroit Foundry Supply Co. Detroit, Mich. I-112
 Diamond Clamp & Plask Co. Richmond, Ind.
 Jos. Dixon Crucible Co. Jersey City, N. J. G-100
 Stanley Doggett. New York City. G-76
 Electric Smelting & Aluminum Co. Leekport, N. Y. F-70
 Elmira Foundry Co. Elmira, N. Y. 162
 Federal Foundry Supply Co. Cleveland, Ohio. I-113
 Felt & Tarrant Mfg. Co. Chicago, Ill. F-84
 The Foundry. Cleveland, Ohio. I-133
 Gardner Machine Co. Beloit, Wis. J-124
 General Electric Co. Schenectady, N. Y. G-74
 Gill Clay Pot Co. Muncie, Ind.
 Goldschmidt Thermit Co. New York City. L-K-163-183
 Graceton Coke Co. Graceton, Ind. Co., Pa. G-98-9
 Hauck Mfg. Co. New York City. I-129
 Herman Pneumatic Machine Co. Zelienople, Pa. M-155-6-175-6
 The Hill & Griffith Co. Cincinnati, Ohio. I-111
 Hunter Saw & Machine Co. Pittsburgh, Pa. J-142
 Ideal Furnace Co. Chester, Pa. G-78
 Ingersoll-Rand Co. New York City. B-18-19
 International Molding Machine Co. Chicago, Ill. G-79-80-81
 Interstate Sand Co. Zanesville, Ohio. I-109
 The Iron Age. New York City. F-73-91

Kellogg & Sons, Spencer. Buffalo, N. Y. I-107
 J. A. Lanigan & Co. Buffalo, N. Y.
 Lincoln Electric Co. Cleveland, Ohio. A-3
 David Lupton's Sons Co. Philadelphia, Pa. F-83
 J. S. McCormick Co. Pittsburgh, Pa. M-160-1
 Walter Macleod & Co. Cincinnati, Ohio. G-82
 The Metal Industry. New York City. I-130
 Midland Machine Co. Detroit, Mich. A-6 & 7
 Monarch Engineering & Mfg. Co. Baltimore, Md. M-172
 Mott Sand Blast & Mfg. Co. Chicago, Ill. A-8
 National Core Oil Co. Buffalo, N. Y. G-93-94
 National Lead Co. New York City. I-108
 New Haven Sand Blast Co. New Haven, Conn. B-16-17
 Niagara Optical Co. Buffalo, N. Y. N-188
 The Norton Co. Worcester, Mass. J-116
 S. Obermayer Co. Cincinnati, Ohio. I-115
 Ohio Manufacturing Co. Painesville, Ohio. I-127
 Ohio Sand Co. Conneaut, Ohio. I-110
 Osborn Mfg. Co. Cleveland, Ohio. L-143-150
 Thos. W. Pangborn Co. Hagerstown, Md. N-192-3-4-5
 J. W. Paxson Co. Philadelphia, Pa. J-134
 Peerless Parting Co. Ottawa, Ill. G-97
 Pickands, Brown & Co. Chicago, Ill. K-185-6
 The G. Piel Company. Long Island City, N. Y. N-192
 Henry E. Pridmore. Chicago, Ill. B-12-13-14-15
 Robeson Process Co. Au Sable Forks, N. Y. P-87
 Roessler & Hasselacher Co. N. Y. City. J-137
 Rogers, Brown & Co. Cincinnati, Ohio. H
 Sand Mixing Machine Co. New York City. L-164-165
 Wm. Sellers & Co. Philadelphia, Pa. D-31-32
 Shepard Electric Crane & Hoist Co. Montour Falls, N. Y. D-25
 W. W. Sly Mfg. Co. Cleveland, Ohio. G-92
 J. D. Smith Foundry Supply Co. Cleveland, Ohio. F-88
 R. P. Smith & Sons Co. Chicago, Ill. P-69
 Standard Alloys Co. Pittsburgh, Pa. I-132
 Standard Linseed Co. Cleveland, Ohio. I-131
 Standard Sand & Machine Co. Cleveland, Ohio. M-175-4
 Sterling Wheelbarrow Co. West Allis, Wis. I-123
 Frederic B. Stevens. Detroit, Mich. I-114
 Superior Sand Co. Cleveland, Ohio. P-68
 Taber Mfg. Co. Philadelphia, Pa. C-21-2-3-4
 Taylor Co., W. P. Buffalo, N. Y. J-120
 Titanium Alloy Mfg. Co. Niagara Falls, N. Y. J-136
 John Tuohy, c/o Columbia Steel Co. Pittsburgh, Cal.
 United States Graphite Co. Saginaw, Mich. F-65
 Vulcan Engineering Sales Co. Chicago, Ill. D-46-53
 Wadsworth Core Machine & Equipment Co. Akron, Ohio. K-189
 Whitehead Bros. Buffalo, N. Y. J-122-3
 Whiting Foundry Equipment Co. Harvey, Ill. I-115
 Wiener Machinery Co. New York City. M-190-1-2
 Wright Mfg. Co. Lisbon, Ohio. L-169

PLAN OF EXHIBITION NEXT WEEK AT BROADWAY ARSENAL, BUFFALO, OF THE FOUNDRY & MACHINE EXHIBITION COMPANY, TOGETHER WITH LIST SHOWING LOCATION OF THE EXHIBITS OF THE PARTICIPANTS IN THE EXHIBITION

The number of exhibits this year totals 104, as against 118 in Pittsburgh in 1911, but the totals of years previous to 1911 are greatly exceeded and what is lacking in number this year may fairly be said to be made up in variety and novelty, several manufacturers having taken space this year for the first time. The exposition, according to announcement, will be open Sept. 23 and Sept. 26 from 9 a. m. to 10 p. m. and on Sept. 24, 25 and 27 will close at 6 p. m. A general admission fee of 25 cents will be charged, and season tickets may be had for \$1.

With a view of facilitating inspection of the exhibits, as well as to show their diversity and to provide a means of readily locating any one in which especial interest may be taken *The Iron Age* presents herewith a diagram showing the numbered allotments of floor space, together with an alphabetical list of exhibitors, which indicates their definite location, and an alphabetical list with a brief outline of the character and extent of each exhibit. In most cases the information as to exhibits was obtained directly through correspondence with manufacturers and much of the newer apparatus shown would be accorded detailed description if space permitted. The general alphabetical list follows:

Exhibitors and What May be Seen

- American Vanadium Company, Pittsburgh, Pa.:—Specimens of vanadium steel and iron castings, such as cylinders, gears, piston rings, journal boxes, safety hooks, locomotive cast iron parts and a number of vanadium cast steel and vanadium cast iron test specimens showing their physical properties, also vanadium cast iron bottle molds and pneumatic and hand chisels and tools of vanadium steel. Represented by George L. Morris and W. J. Bird.
- Arcade Mfg. Company, Freeport, Ill.:—Molding machines ranging from a small hand squeezer to a three-cylinder jolting machine; also pattern plate methods, rotary sand sifters, sample castings of intricate design. Represented by E. H. Morgan and others.
- Baird & West, Detroit, Mich.:—Joint exhibit with Pickands, Brown & Co.
- Jonathan Bartley Crucible Company, Trenton, N. J.:—Regular crucibles in the various sizes, together with tilting furnace crucibles, retorts and specialties. Represented by S. H. Dougherty, H. D. Cole and Lee T. Ward.
- Bennett-O'Connell Company, Chicago, Ill.:—Electro-plating apparatus, including late types of plating dynamos, one of which will be a direct-connected unit and in operation. Also polishing and buffing lathes, special rheostats, polishing and buffing composition, felt and canvas wheels and other accessories. Represented by M. J. O'Connell and S. E. Huenerfauth.
- Berkshire Mfg. Company, Cleveland, Ohio.:—Hand squeezer and pattern drawing molding machines, plain squeezer molding machines, vibrators; also iron, wood and aluminum snap flasks. Represented by R. H. York, W. D. Fraser, E. W. Sample, C. F. Battenfeld, George S. Capes, F. Hulec and William H. Nicholls.
- Charles H. Besly & Co., Chicago, Ill.:—Combination pattern-makers' disk grinder with drum attachment, Besly band polishing machine and other devices, all under power. Represented by Edward P. Welles, C. A. Knill, W. H. Allen and Charles Munson; also by representatives of the Prentiss Tool & Supply Company.
- S. Birkenstein & Sons, Chicago, Ill.:—Metal for brass and aluminum foundries, including ingot copper, brass ingots (pig), aluminum, solders, Babbitt, etc. Represented by Harry Brown, Lew Kahn and Harry Birkenstein.
- Blystone Machinery Company, Cambridge Springs, Pa.:—Sand mixer, core sand mixer, facing mixer, core sand and facing mixer. Represented by P. L. Blystone, W. E. Wright and H. J. Le Fevre.
- Brown Specialty Machinery Company, Chicago, Ill.:—Hammer core machines.
- A. Buch's Sons Company, Elizabethtown, Pa.:—Jar and squeeze molding machines, aluminum snap flasks and cope boards, cast iron pattern plates for mounting patterns, cast iron casings, bottom plates, frames, flasks for gravity machine and pouring ladles with shank and bail, steel flask bars, etc.
- Buckeye Products Company, Cincinnati, Ohio.:—Parting compounds, core compounds, melting furnaces and furnace cement. Represented by C. J. Goehring, C. S. Weigert, R. B. Ferguson and J. B. Carpenter.
- Buffalo Forge Company, Buffalo, N. Y.:—New Spiro turbines operated by compressed air instead of steam driving a steel pressure blower. Also various types of fans, some direct-connected to electric motors. Included are two steel pressure blowers for cupola service, a B volume exhauster, a steel plate fan, motor-driven disk fan and roof ventilators.
- Buffalo Scale Company, Buffalo, N. Y.:—Transverse bar testing machine, a new type of full steel-framed suspension bearing dormant scale for particularly accurate foundry weighing, a suspension bearing platform scale for fine work in weighing small castings, crane scales and other types.
- Carborundum Company, Niagara Falls, N. Y.:—Carborundum wheels for foundry work, fire sand for lining forges and furnaces, Aloxite cloth for general work and Aloxite wheels for tool grinding. Represented by George R. Rayner, C. C. Dobson, Anthony Dobson, C. C. Lathrop and F. E. Gridley.
- Chicago Pneumatic Tool Company, Chicago, Ill.:—Pneumatic and electric labor-saving devices for foundry and machine shops, including chipping hammers, rammers, grinders, sand sifters and electric grinders, also in operation an air compressor of new, inclosed high-speed, self-oiling type. Represented by Ross Watson and A. C. Andriesen.
- Cleveland Pneumatic Tool Company, Cleveland, Ohio.:—Pneumatic sand rammers in operation, portable grinder for steel and gray iron castings, also riveting and chipping hammers, air drills for all purposes, including compound machines and corner drills for close quarter drilling.
- Cleveland Wire Spring Company, Cleveland, Ohio.:—Steel foundry barrels, steel kegs, steel shelving, steel tote, shop and spruce boxes and coiled wire springs. Represented by J. W. Campbell and J. B. Marshall.
- Crawford Oil & Chemical Co., Cleveland, Ohio.:—Core, match and special oils. Represented by P. S. Crawford and Werner G. Smith.
- Curtis & Co. Mfg. Company, St. Louis, Mo.:—Traveling cranes on runway, air compressor in operation furnishing air for a pendant air hoist attached to the crane, also a jib crane on which will be a trunnion air hoist, closed hopper sand blast, overhead trolleys, etc. Represented by F. N. Rumbley and E. J. Clark.
- Davenport Machine & Foundry Company, Davenport, Iowa.:—8,000-lb. multiple cylinder jolt machine with table 42 in. x 6 ft., portable sandstraddling power squeezer, portable jolt squeezer, portable 500-lb. jolt machine, 10 x 12 stripping plate machine, automatic duplex squeezer, 1000-lb. jolt rockover pattern drawing machine and hand-rammed rollover pattern drawing machine. Represented by J. T. Anderson, J. Long and A. J. Goss.
- Delevan Mfg. Company, Brooklyn, N. Y.:—Will demonstrate the use of Stewart's liquid core compound in making and baking cores. Represented by A. R. Townsend and W. H. Stewart.
- Detroit Foundry Supply Company, Detroit, Mich.:—Accommodations for the convenience of patrons and visitors. Represented by W. B. Howard, M. Z. Fox, Mr. Lyle and F. McCarthy.
- Joseph Dixon Crucible Company, Jersey City, N. J.:—Crucibles, plumbago facings for foundry work, belt dressings and Dixon's silico-graphite paint for smokestacks, etc. Represented by J. A. Condit.
- Electric Smelting & Aluminum Company, Lockport, N. Y.:—Brass founders' alloys—aluminum, nickel aluminum, No. 15 aluminum alloy, aluminum solder and bronze, silicon copper, manganese copper, alloy and bronze, silver bronze, Babbitt metal and solders. Also mineral cleaner for cleaning metal. Represented by L. O. Robson.
- Federal Foundry Supply Company, Cleveland, Ohio, and Milwaukee, Wis.:—Perfect fit mold jackets, plumbago mold jackets, parting, core compound, core wash, core oil, etc. Represented by W. J. Adams and Ralph Ditty.
- Felt & Tarrant Mfg. Company, Chicago, Ill.:—Comptometer adding and calculating machines and their application to the iron and steel industry demonstrated. A feature will be a new payroll model designed to facilitate the making up of payrolls; machines also will demonstrate their practicability in the calculation of costs, discounts, figuring of estimates, computation of weights and measures, etc. Represented by J. C. Nevins, I. N. Mint and Edgar S. Stubbs.
- Gardner Machine Company, Beloit, Wis.:—A 53-in. horizontal disk grinder, 26-in. double disk grinder, 30-in. patternmakers' disk grinder, ball bearing polishing lathe, ring wheel chucks and disk grinder accessories. Represented by L. W. Thompson, J. M. Gardner and H. C. N. Smith.
- General Electric Company, Schenectady, N. Y.:—Ten-ton storage battery locomotive equipped with 70-cell Edison storage battery, also air compressors, centrifugal blowers and motor-driven grinders. Represented by J. F. Carrick.
- Gill Clay Pot Company, Muncie, Ind.:—Fire clay products, such as brass furnace liners, covers, stools, base blocks, cupola blocks and special shaped blocks used by brass and iron founders. Also part of an old liner that gave 32 months' service, producing over 2500 melts with a No. 60 crucible. Represented by Charles O. Grafton.
- Goldschmidt Thermit Company, New York, N. Y.:—Materials used in the Thermit process in welding steel and wrought iron sections will be shown, as well as sample welds. The method will be illustrated with motion pictures showing all the steps in welding a locomotive frame, the sternpost of a steamship and rails in paved streets. Also a practical demonstration of Thermit welding as applied to filling up blowholes in castings. In addition there will be shown samples of the company's carbon-free metals and alloys, including a new alloy, carbon-free ferrochromium, produced by the aluminothermic process. Represented by Dr. E. A. Beck, the company's metallurgist, A. F. Braid and J. G. McCarthy.
- Gracetone Coke Company, Gracetone, Pa.:—Foundry and heating coke, refuse from coal washer and views of plant. Represented by C. M. Lingle, M. F. Brandon, Niles Anderson and Paul Debevoise.
- Hauck Mfg. Company, Brooklyn, N. Y.:—Hauck patent burners for lighting cupolas and drying molds, kerosene hand torches, furnace burners for core ovens, etc. Represented by A. H. Stein and Willis C. Squire.
- Herman Pneumatic Machine Company, Zelienople, Pa.:—Jarring machines, including one which will jar ram large flasks, roll them over and draw the pattern, the latter being held horizontally while the flask is drawn from it. Another will jar ram and squeeze the flask and the pattern is drawn through the stripping plate. Also shown will be jar ram core machines. Represented by M. L. Heyl.
- Hill & Griffiths Company, Cincinnati, Ohio.:—Booth for the reception of visiting foundrymen.
- Hunter Saw & Machine Company, Pittsburgh, Pa.:—Saw grinding machine, an inserted tooth grinding machine of a new type, Hunter Duplex inserted saw tooth blades, solid saw for Highley machine ground with Hunter special tooth, 24-in. saw for Newton machine, 36-in. vanadium steel hot saw, 46-in. high-speed vanadium friction disk. Represented by F. A. Hunter and G. W. Agerter.
- Ideal Furnace Company, Chester, Pa.:—Coke fired tilting furnace for melting nonferrous metals. Represented by P. J. Sweeney.
- Ingersoll-Rand Company, New York, N. Y.:—12 and 7½ x 12 Imperial XB short belt drive air compressor with electric motor, 2½ x 3 Imperial XII motor-driven compressor, 4½ x 5 Imperial XII motor-driven compressor (new type) Crown and Imperial chipping, riveting and scaling hammers, Imperial air motor hoists, stationary motors and piston drills, the new Little David metal drills and Crown rotary drills. All machines will be exhibited under working conditions, run by air from the compressors. There also will be shown sectional models of the tools. Represented by W. H. Armstrong, J. L. Kelly, J. Moran and E. P. Mooney.
- International Molding Machine Company, Chicago, Ill.:—Stripping plate machine, squeezer, hand turnover draw machine, core machine, power turnover, power draft machine, and a jar ramming machine, the last three being of new and interesting design. Represented by Edward A. Fridmore, W. W. Miller and J. W. Dopp.
- Interstate Sand Company, Zanesville, Ohio.:—Represented by L. K. Brown, E. M. Ayers and F. L. Moore.
- Spencer Kellogg & Sons, Buffalo, N. Y.:—Foundry oil for the production of oil sand cores. Represented by Milton F. Finley and Urban M. Frink.

- Lincoln Electric Company, Cleveland, Ohio:—An electric welder for the repair of broken metal pieces or the repair of defective castings, alternating and direct current motors, motor generator sets and automatic charging apparatus. Represented by J. F. Lincoln, Max C. Ewing and T. E. Sturman.
- David Lupton's Sons Company, Philadelphia, Pa.:—The Pond truss, a special roof formation particularly designed for forge shops and foundries, together with products for insuring daylight and ventilation in industrial buildings, such as Pond continuous sash, Pond operating device and Lupton's steel sash. Represented by Clarke P. Pond and C. F. Buckwalter.
- Walter Macleod & Co., Cincinnati, Ohio:—Sand blasts which operate without a sand valve, Buckeye heaters or portable oil burners for cupola lighting, skin drying molds and cores, portable furnace for melting Babbitt, oil fuel pneumatic rivet forge, newly designed sand separators and dryers and oxy-acetylene apparatus for welding. Represented by Walter Macleod and W. F. Stodder.
- J. S. McCormick Company, Pittsburgh, Pa.:—McCormick continuous sand mixer, Blystone sand mixer, Deane pneumatic sand riddler, Murphy pistol sprayer, also samples of Vulcan and Ajax blacking. Represented by T. E. Malone and S. R. Costley.
- Midland Machine Company, Detroit, Mich.:—New power jolt ramming rollover machine. Represented by G. L. Grimes and Charles Skeffington.
- Monarch Engineering & Mfg. Company, Baltimore, Md.:—Latest 1912 models of Monarch improved furnaces using oil, gas or coke for fuel for melting, heating, forging, annealing, heat treatment, etc., Acme core ovens, crucible or non-tilting, stationary or pit drop bottoms and reverberatory furnaces, Fowler heaters for foundry ladles, blowers, pumps, etc. Represented by James J. Allen, M. W. Woodrow, James H. Fowler, Harry D. Harvey and Joseph Rinicker.
- Mott Sand Blast Mfg. Company, Chicago, Ill.:—Sand blast equipment in operation, including machine operating under any pressure from 3 lb. up and adaptable for the hardest as well as the softest of metals. Represented by E. J. Rosenthal and George Fletcher.
- National Lead Company, New York City:—Pressure die castings, Babbitt metals, white lead, red lead, linseed oil, solder. Represented by Robert Andrews, J. E. Curtis, New York, and P. J. Hoeller and A. S. Thompson, Buffalo.
- New Haven Sand Blast Company, New Haven, Conn.:—Self-contained sand blast machines, sand blast equipment, sand blast rolling barrels, sand blast supplies and dust arrestors. Represented by C. A. Dreisbach.
- Norton Company, Worcester, Mass.:—Display of grinding wheels, both Alundum and Crystolon, and the raw materials or abrasives used in their manufacture; also various sizes of bench and floor grinding machines, some protected with protection devices, dust exhaust systems, etc. Represented by E. W. Dodge, Carl F. Dietz, M. A. Williamson, George S. Welker and George C. Montague.
- S. Obermayer Company, Chicago, Ill.:—A new core venting device. Represented by S. T. Johnston, F. H. Dodge, W. M. Fitzpatrick, E. D. Frohman, O. C. Olson and O. J. Peterson.
- Ohio Mfg. Company, Painesville, Ohio:—Sheet steel factory and foundry equipment, such as steel barrels, boxes, pans, racks, stools, etc. Represented by H. A. Post.
- Ohio Sand Company, Conneaut, Ohio:—Samples of molding sand and accommodations for visiting foundrymen. Represented by U. E. Kanavel and F. E. Gordon.
- Osborn Mfg. Company, Cleveland, Ohio:—New type of direct draw rollover jolt machine, plaint jolt, baby core jolt, adjustable drop plate flask strippers and stripping plate machines, hand direct draw rollover machines, rockover drop draft machine and drop plate and plain squeezer machines. Represented by H. R. Atwater and J. H. Galloway.
- Thomas W. Pangborn Company, Hagerstown, Md.:—Pangborn modern high pressure sand blast machines, stationary and portable, sand separators, sand dryers, air separators and a new type of self-contained sand blast barrel in operation, and which has never been shown in public before. Samples of sand blasted castings will be shown, with illustrations of complete sand blast cleaning rooms. Represented by J. C. Pangborn, H. D. Gates, A. L. Holmes, J. J. Bowen, Foster J. Hull, Charles T. Bird and Harry W. Shockey.
- J. W. Paxson Company, Philadelphia, Pa.:—Tramrail system, improved pneumatic tripod sifting machine, sand blast machinery, making cores with a new liquid core binder on a core machine and by hand, also exhibits of supplies, equipment, photographs and blueprints. Represented by H. M. Bougher, Howard Evans, E. M. Taggart, J. F. Gaehring, W. S. Thomas and I. F. Kremer.
- Peerless Parting Company, Ottawa, Ill.:—Partings, samples of various grades of tripoli and silica, also practical demonstrations. Represented by A. W. Mann.
- Peterson-National Core Oil Company, Buffalo, N. Y.:—A merger of the T. J. Peterson Company, Chicago, and the National Core Oil Company, Buffalo. Core oil, dry core compound, parting. Represented by T. J. Peterson and James A. Drake.
- Pickands, Brown & Co., Chicago, Ill.:—Solvay foundry coke and crushe coke, arranged in the form of miniature Niagara Falls. Represented by Thomas W. Glassco, George A. T. Long, Bayard T. Bacon, Edwin A. Bateman and James A. Galligan.
- Henry E. Pridmore, Chicago, Ill.:—Stripping plate molding machines, rock-over drop molding machine, electrically-driven jarring machine and late type of air squeezer machine. Represented by Mrs. Henry E. Pridmore, Henry A. Pridmore, A. V. Magnuson, R. E. Turnbull and D. F. Eagan.
- Robeson Process Company, Plattsburg, N. Y.:—No special exhibit. Represented by D. S. Robeson and W. Ed. Baird.
- Rogers, Brown & Co., Cincinnati, Ohio:—A replica of No. 4 blast furnace of the Rogers-Brown Iron Company, Buffalo, and a series of motion pictures illustrating modern methods in the iron industry from ore to steel. Also samples of pig iron, ferromanganese, ferrophosphorus and Rosiclar fluor spar.
- Sand Mixing Machine Company, New York:—Self-propelled and labor-saving machine for cutting and handling molders' sand which also will mix core and facing sands. Also an indestructible traveling molders' bench made from steel angles, the purpose of which is to "bring the bench to the sand instead of the sand to the bench." Represented by V. E. Minich, William A. Heartt and Hutton H. Haley.
- William Sellers & Co., Inc., Philadelphia, Pa.:—Motor-driven drill and tool grinding machines, motor and belt-driven centrifugal sand mixing machines, all in motion. Represented by Edward L. Holljes.
- W. W. Sly Mfg. Company, Cleveland, Ohio:—Cleaning mills, cinder mills, dust arresters, rosin grinders and improved sand blast equipment. Represented by W. C. Sly, George J. Fanner, P. W. Crowe, T. J. Morgan and B. H. Reddy.
- J. D. Smith Foundry Supply Company, Cleveland, Ohio:—Sand blast machine.
- Standard Alloys Company, Pittsburgh, Pa.:—Brass, bronze and nickel-silver metals which have been treated with vanadium and uranium alloys while in a molten condition, showing the improved quality of the alloys so made by the increased density of structure, enrichment of color and increase in tenacity and elongation of specimens. Also ores and metal products. Represented by Joseph A. Kelly, L. S. H. Gable and C. Powell Karr.
- Standard Linseed Company, Cleveland, Ohio:—Foundry linseed oils, core oils, etc. Represented by W. Weisenberg.
- Standard Sand & Machine Company, Cleveland, Ohio:—Sand mixers, sand conveying machinery and molding sands. Represented by H. G. Boughton, J. A. Boughton, E. J. Smith and J. L. Hopper.
- Sterling Wheelbarrow Company, West Allis, Wis.:—Special rolled foundry flasks and foundry barrows. Represented by I. R. Smith.
- Frederick B. Stevens, Detroit, Mich.:—"The Elephant." Represented by James F. Hughes, George B. Bell and Alfred T. Wagner.
- Superior Sand Company, Cleveland, Ohio:—Samples of molding sands for the production of heavy, medium and light malleable castings, gray iron, brass and aluminum castings. Represented by W. H. Smith and H. C. Koontz.
- Tabor Mfg. Company, Philadelphia, Pa.:—Plain jarring machines, shockless jarring machines, combined jarring and roll-over machines, combined jarring and squeezing machines, hand and power roll-over, power squeezer, split pattern machines and a combined jarring and roll-over machine having a capacity of 3000 lb. and weighing about 18,000 lb. Represented by John T. Ramaden, Wilfred Lewis, H. W. Brown, J. H. Coleman, C. H. Ellis, G. B. Hastings, Dudley Willcox, D. J. Martin and H. W. Impey.
- Titanium Alloy Mfg. Company, Niagara Falls, N. Y.:—Various grades of alloys of the company's manufacture and specimens of treated and untreated metals. Represented by Charles V. Slocum, Charles Vickers and A. C. Hawley.
- H. G. Trout Company, Buffalo, N. Y.:—Charging machine.
- John Tuohy, foundry foreman of the Columbia Steel Company, Pittsburgh, Cal.:—Patented adjustable flask and flask bar which can be so combined as to make and bar any sized flask from 24 in. to 9 ft., advancing in width and length in steps of 6 in. No bolts or rivets are employed and the only tool necessary to secure the parts or disassemble them is a common hammer. Asserted to meet severe conditions and to be a money-saver.
- United-States Graphite Company, Saginaw, Mich.:—Booth with accommodations for friends and customers. Represented by H. C. Woodruff, F. B. Goddard, J. G. Drought and L. B. Passmore.
- Vulcan Engineering Sales Company, Chicago, Ill.:—Improved Mumford jolt ramming machines, Mumford hand squeezer, electric cam jolt rammer, pit pattern draft machine, high trunnion squeezer, split pattern machine, Q.M.S. automatic saw grinder, post jib crane of two tons capacity, steel foundry saw, power hack saw machines, Hanna sand shakers, Hanna electric riddle oscillator, revolving dumping riddle, mold dryer, Hanna pneumatic riveter, cylinder stationary pneumatic punch and other foundry equipment, much of it in motion. Represented by H. K. Gilbert, James T. Lee, E. H. Mumford, T. J. Mumford, F. W. Hamel, Carl Falk, A. F. Ehrenhaft, David Whyte, E. M. Huggins and J. T. George-son.
- Wadsworth Core Machine & Equipment Company, Akron, Ohio:—Wadsworth improved core making machines, Wadsworth-Detroit machines for making general and test cores, Wadsworth core testing machines and gas and gasoline core ovens for laboratory use in baking test cores. Represented by George H. Wadsworth, A. N. Kelley and H. M. Lane.
- Wiener Machinery Company, New York:—Dustless automatic sand blasting machines of the revolving table type. Also a triple combination punch, shear, bar and angle cutter, which is described as "practically a complete structural shop in a single steel frame," bar cutters, pneumatic sand rammers and chipping and riveting hammers. Represented by F. H. Scantlebury, E. G. Schmeisser and Ernst Wiese.
- Whitehead Brothers, Buffalo, N. Y.:—Samples of foundry sand and foundry facings.
- Whiting Foundry Equipment Company, Harvey, Ill.:—Catalogues, photographs and prints of interest to the foundry trade.

Corrigan, McKinney & Co.'s New Steel Plant

Corrigan, McKinney & Co., Cleveland, Ohio, have completed plans for the buildings for their new steel plant in Cleveland and will ask for bids shortly. It is expected that the contract for the equipment for the eight open hearth furnace plant and blooming mill, for which inquiries were sent out several weeks ago, will be closed within a month, but it is improbable that erection will be started before early next year. The project has been held back somewhat by the absence of H. G. Harrison, the engineer, who returned during the week from a trip to Europe where he went to inspect various steel making plants. No decision as to the finishing department is likely for some time. Three plans are under consideration: One is a rail mill; another a rail and merchant mill, and the third is a continuous billet mill for rolling billets and sheet bars.

The Wm. B. Scaife & Sons Company, Pittsburgh, has issued a pamphlet entitled "The Selection of a Boiler Feed Water," being a paper read by J. C. William Greth before the Engineers' Society of Western Pennsylvania on April 5, 1910. Copies will be sent to any address upon application.

The Story of Iron in Motion Pictures

Processes, from Ore to Steel, to Be Illustrated
by Rogers, Brown & Co. at the Foundry-
men's Exposition in Buffalo Next Week

A pictorial story of iron from the time the ore is mined until it has been transformed into the finished product, such as steel rails or sheet steel piling, will be the special feature of an exhibit of Rogers, Brown & Co. at the convention of the American Foundrymen's Association next week in Buffalo, N. Y. It will undoubtedly prove a commanding attraction not alone for its novelty, but because of the instruction it will afford and the fact that it has been for something like nine months in preparation at no small expense. For that many months experts in motion pictures have been at work under the supervision of H. B. B. Yergason, of Rogers, Brown & Co., and the result is pronounced one of the most complete series of moving picture films ever made of an industrial subject. They run about one hour and ten minutes and cover the entire range of the mining, handling and shipping of iron ore, the manufacture of pig iron and a few of the more interesting steel processes. Step by step the observer is taken over the territory from the great mining districts in Hibbing, Minn., and down the Great Lakes to the plant of the Rogers-Brown Iron Company in Buffalo. Nearly all of the pictures are of properties in which Rogers, Brown & Co. are interested, either through their ownership of, or holdings in, the iron ore ranges, blast furnaces and vessels, or through affiliated companies.

In the course of the series, of which but an outline can be given here, are such scenes as a panoramic view of the Mahoning mine at Hibbing, a trip of a flat car through the mine showing the operation of shovels, the shipment of ore and working of the various levels. Similar views are shown of the Susquehanna mine of the company portraying the heavy stripping and the operation of the largest steam shovels. From this point there follow in detail the transportation of the ore to Duluth, then its handling and shipping through the docks at that place. A unique view is one of the hold of a lake ore carrier, of which the company controls three of 10,000 tons capacity each, showing an avalanche of ore pouring into the boat. There are views of the big freighters on their way down the lakes to the furnaces and those en route at the Soo and the St. Clair River.

At the furnaces the operations of unloading, the stocking of the ore, its distribution and the charging of blast furnaces are shown in detail. Then follow the different methods used in opening the blast furnaces prior to the run of iron. One picture shows the metal running the length of the main runner, and the successive opening of the channels to the sows—damming the molten iron in the leader, conducting it into the sow and into the pigs, and showing the action in keeping the iron notch open and the flow of iron free. During this view is shown the sampling from the molten iron for the chemists' use and record of the cast. Then come the journey to the breaker, the handling of pig iron by electro-magnet and its transportation. A pig casting machine in operation is another of the features.

In addition there are a series of pictures showing the interior of the Bessemer converter room of the Lackawanna Steel Company, the charging, blowing, insertion of spiegel, emptying of converter, distribution ladle and pouring of molten steel into ingot molds, then stripping, reheating the ingots and operations preliminary to rolling rails and sheet piling. One of the views shows hydraulic shears cutting steel slabs 27 in. broad and 6 in. thick.

Another effective feature of the Rogers, Brown & Co. exhibit will consist of a replica of the Rogers-Brown Iron Company's No. 4 blast furnace at its Buffalo plant, comprising furnace stack, stoves, smoke stack, dust catcher, cast house, etc. The cast house is used as a small auditorium, and it is here that the pictures showing modern methods in the iron industry will be presented. The company's exhibit occupies Section H in the exposition building, located at the end of the central aisle opposite the main entrance, as indicated in the plan of the building reproduced elsewhere in this issue.

The Gerhart Spring Tire Company, Marietta, Ohio, has been incorporated with a capital stock of \$15,000.

A Large Dodge Casting

That the Dodge Mfg. Company, Mishawaka, Ind., does not confine all its efforts to the manufacture of stock goods in transmission machinery was demonstrated September 13, when a split iron sheave, 24 ft. pitch diameter, with a 40-in. face width, was cast in its south foundry. It required about ten days for the foundrymen to shape up the mold, about two hours to prepare for the pour and a little over two minutes to pour the metal—approximately 53,000 lb.

The wheel, when finished, will weigh about 45,000 lb. It was made for the Anaconda Copper Mining Company, Anaconda, Mont., for use on the shaft of a 46 x 60 duplex blowing engine. It is grooved for 20 1 3/4-in. Dodge Firmus manila ropes, has a 16-in. bore and will be driven by another sheave 48 in. in diameter on a 750 h.p. motor at 59 rev. per min. It was cast in two sections and will be shipped in that condition. After it leaves the machine shops at Anaconda the halves will be fastened together permanently by bolts through rim lugs.

Several years ago the Dodge Mfg. Company made a large wheel for the Kokomo Steel & Wire Company, Kokomo, Ind. This was also 24 ft. in diameter and weighed 80 tons. It was of four-piece construction, consisting of two split pulleys bolted together by internal rim flanges.

Both wheels were cast under the direction of Harry Bell, superintendent of foundries.

Bankers Trust Company Sprinklers

The problem of water supply for a system of Grinnell automatic sprinklers 500 ft. above the sidewalk in the new building of the Bankers Trust Company, New York City, was a matter of some difficulty. The installation of pipes and the placing of heads follow the usual regulations, but on account of the extreme altitude at which the equipment is placed—it covers six floors from the thirty-second to thirty-seventh, inclusive—it was necessary to make special provision for the water supply. The primary supply is from two 1250-gal. steel pressure tanks located on the thirty-second and thirty-seventh floors, respectively. The second supply comes from high pressure pumps of 250 gal. per min. each, located in the sub-basement. The third supply is from a Siamese steamer connection outside the building at street level, into which a fire engine can pump a sufficient volume of water to supply this lofty sprinkler system.

When it is realized that the static pressure between the thirty-seventh floor and the pumps in the sub-basement is approximately 250 lb. per sq. in., it is seen that to supply a workable pressure for the sprinklers at this height requires a pressure at the pumps of not less than 300 lb. per sq. in., which involves the use of extra heavy piping and fittings throughout and the most extreme care in the design and workmanship.

On Tuesday morning, September 17, about 200 members of the International Congress of Applied Chemistry arrived in Pittsburgh. On Tuesday a visit was made to the Clairton works of the Carnegie Steel Company and on that evening a banquet was given at the Schenley Hotel. On Wednesday visits were made to the Homestead steel works, the plant of the Westinghouse Electric & Mfg. Company and other works in the Pittsburgh district.

Stewart C. Coey, of the electrical department of the Youngstown Sheet & Tube Company, Youngstown, Ohio, will read a paper on "Electric Power Production and Distribution in Steel Mills" at the semi-annual meeting of the American Iron and Steel Institute to be held in the Hotel Schenley, Pittsburgh, October 25 and 26.

J. J. McCabe, 30 Church street, New York, will exhibit at the American Electric Railway Association convention, Chicago, October 7 to 11, his new double spindle lathe, a feature of which is a novel tool rest used in turning M. C. B. wheels. The machine will be in operation under actual working conditions.

Buena Vista Furnace, of the Allegheny Ore & Iron Company, Buena Vista, Va., will be ready to be blown in early in October. New engines, boilers and other machinery have been installed.

Features of a New German Iron Foundry

The new plant of the Rödighausen foundry at Menden, i. W., described in a recent issue of *Stahl und Eisen*, has several special features. In the first place the material used in construction is reinforced concrete throughout, except for an outside facing of brick. The main building is 65 ft. 6 in. wide, 172 ft. 1 in. long, with an arched roof. There are to be two side bays, one of which is finished, 41 ft. wide. The building was completed in about four months.

The product of the foundry is all kinds of small light castings from 0.08 in. thickness upwards, some of which are shipped without finish and others bronzed, lacquered or galvanized. The latest methods are employed, including the use of 38 double molding machines. The central frame of these molding machines is made of aluminum alloy, so as to reduce weight and the consequent strain on the workmen, of whom 100 are employed. Electricity produced in a central station is the power used for furnishing blast and other purposes, and also for lighting. The cupola building is of reinforced concrete, and communicates with the central building through a wide opening. There are two cupolas of 4 metric tons hourly capacity each. The coke ratio is 1 to 9, due to the extreme fusibility of the iron necessary for the thin walled castings. Both cupolas discharge their gases into a common spark chamber. On one side of the cupola building is the charging room, built simply of brick work with a lean-to roof. It is provided with proper tracks and a charging scale.

The cupola building deserves special mention because of a new automatic charging arrangement, designed by E. Vorbach. It is entirely different from existing types, in that the charge drops vertically into the cupola, in the way obtained by hand charging, and is directly opposed to the ideas of foundry experts that mechanical charging with cupolas of less than 8 tons hourly capacity would be a failure. For many months it has been in continuous operation, without causing trouble of any kind. The composition of the iron obtained corresponds to that from the old hand-charged cupolas, as seen by daily analyses.

Both cupolas are provided with a sloping track inside the furnace, at the level of the usual charging door. The floor of the elevator cage has a track of the same angle and gauge, which continues the furnace track when the elevator is raised. Transversely to the track in the elevator cage are two hanging self-closing tongs, which hold the charging car fast. Exactly above these tongs in the elevator shaft are two striking blocks, against which the upper part of the tongs strikes, so that when the cage is raised to the proper position the car is released. The charging car carries a holder, the bottom of which is formed of two plates that can open downward, and so drop the charge vertically. The plates are brought back to position by counterweights. On both sides two bolts are arranged, the lever arms of which are connected by a bar, by means of which the holder is kept closed. The charging car when released runs down the track to the cupola and by means of a suitably placed striking block the container is opened and the charge vertically and uniformly distributed over the whole section of the furnace.

In order to bring the car back into the elevator the following arrangement is used: On one side of the charging car is a vertically projecting fork. Shortly before the car attains its highest position this fork engages in an eye. The eye is connected, through a stationary funnel-shaped casting, with a wire cable that passes over a pulley and is fastened to a counterweight. The weight is adjusted so that it will bring the empty car back to the elevator cage. As mentioned before, this method of charging has worked without any trouble and has the further advantage that it enables the cupola building to be made much smaller.

Very careful arrangements are made in the Rödighausen plant to keep accurate record of the charges and the amount tapped, so that there is no danger of the cupola being overcharged or getting too low. These arrangements are described in detail in the original paper; through them the whole process is automatic, so that nobody is required on the charging floor.

The plant is lighted by tantalum filament lamps, 9 ft. 10 in. above the floor. These are preferred to carbon arcs because of their long life and the little attention they need.

G. N. W.

The Cast Iron Pipe Industry

We have made strenuous efforts to secure from the United States manufacturers of cast-iron water and gas pipe the statistics of production for the past six years. The figures have been obligingly furnished by all the manufacturers except the United States Cast Iron Pipe & Foundry Company and James B. Clow & Son. Omitting these, the output in this country has been as follows:

Years.	Net tons.	Years	Net tons.
1906	343,306	1909	389,119
1907	365,760	1910	437,763
1908	358,366	1911	416,181

It may be presumed that the production of the two makers not reporting has varied proportionately during the years covered by this inquiry. The partial figures of output above given show that the industry has made a healthy gain in the six years covered. The increase was almost continuous from year to year until 1911, when the pipe trade was affected unfavorably just as other branches of iron and steel industry have suffered. The figures above given include the production of two new companies, the American Cast Iron Pipe Company, Birmingham, Ala., which began to make pipe in 1907, and the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., which began operations in 1910.

Following is a list of the manufacturers of water and gas pipe in the United States and Canada:

Eastern Territory

R. D. Wood & Co., Camden and Florence, N. J.; sizes, 2 to 72 in.
United States Cast Pipe & Foundry Company, Burlington, N. J., Buffalo, N. Y., and Scottdale, Pa.
Standard Cast Iron Pipe & Foundry Company, Bristol, Pa.; sizes, 3 to 48 in.
Warren Foundry & Machine Company, Phillipsburg, N. J.; sizes, 2 to 60 in.
Donaldson Iron Company, Emaus, Pa.; sizes, 2 to 36 in.
American Car & Foundry Company, Berwick, Pa.; sizes, 3 to 16 in.
Delaware, Lackawanna & Western Railroad Company, Scranton, Pa.; sizes, 4 to 12 in.
Utica Pipe Foundry Company, Utica, N. Y.; sizes, 3 to 30 in.
Central Foundry Company, Newark, N. J., and Baltimore, Md.

Southern Territory

Glamorgan Pipe & Foundry Company, Lynchburg, Va.; sizes, 1½ to 20 in.
Lynchburg Foundry Company, Lynchburg and Radford, Va.; sizes, 2 to 36 in.
United States Cast Iron Pipe & Foundry Company, Chattanooga, Tenn., Louisville, Ky., Birmingham, Ala., Anniston, Ala., and Bessemer, Ala.
American Cast Iron Pipe Company, Birmingham, Ala.; sizes, 3 to 20 in.
Sheffield Cast Iron Pipe Company, Sheffield, Ala.
General Pipe & Foundry Company, Atlanta, Ga.
Jim Hogg's Pipe Foundry, State of Texas, Rusk, Texas; sizes, 4 to 36 in.
Central Foundry Company, Holt, Ala.

Central Territory

James B. Clow & Son, Newcomerstown and Coshocton, Ohio; sizes, 3 to 60 in.
Massillon Iron & Steel Company, Massillon, Ohio; sizes, 3 to 60 in.
United States Cast Iron Pipe & Foundry Company, Columbus, Cleveland, and Addyston, Ohio, and West Superior, Wis.
American Car & Foundry Company, Detroit, Mich.; sizes, 4 to 42 in.

Western Territory

Colorado Fuel & Iron Company, Pueblo, Col.; sizes, 3 to 20 in.
Oregon Iron & Steel Company, Oswego, Ore.; sizes, 4 to 32 in.

Canada

Canada Iron Corporation, Ltd., Montreal: Three Rivers, Quebec, daily capacity 150 net tons, sizes 4 to 48 in.; Londonderry, Nova Scotia, capacity 50 tons, sizes, 4 to 48 in.; Fort William, Ontario, capacity 100 tons, sizes 4 to 24 in.
National Iron Works, Toronto; capacity 175 tons, sizes 3 to 72 in.
Gartshore-Thompson Pipe & Foundry Company, Ltd., Hamilton; capacity 60 tons, sizes 3 to 60 in.
Canada Foundry Company, Ltd., Toronto.

The sizes made by the United States Cast Iron Pipe & Foundry Company range from 3 to 84 in.

An effort was made to secure the figures giving the daily capacity of the various foundries, but the results were not satisfactory because of the peculiar conditions of the pipe trade. Foundries making a wide range of sizes reported that they could not give an accurate statement because of the irregularity in output, as when their pits are running on large sizes the output per day will be much heavier than when the make consists mainly of small sizes. Estimates made by some of the best informed in the trade put the total daily capacity of the cast iron pipe plants of this country at slightly over 5600 net tons, crediting the United States Cast Iron Pipe & Foundry Company with about 3000 tons.

Trouble with New Foundry Plants

Mistakes as to Design, Construction and Equipment Are Often Costly—Economical Relation of Departments and Apportioning of Space

BY H. M. LANE

In designing a machine to produce duplicate work, a skilled engineer considers first the product and the raw material from which it is to be made. He must then consider the handling of the stock to the machines, the most economical way of removing the finished product and scrap from the machines, the economy of power and the most effective means of realizing a good return from workmen's time. The main economy of cutting tools must also be considered. In the designing of the machine itself all parts must have a proper weight and strength to resist constant shock and vibration. In fact, he tries to so design a machine as to get a maximum production at a minimum cost, both in labor and material; he also strives to get the maximum effective life from the machine.

Early Stages of a Building Project

When a foundry is added to the plant of the average manufacturing company, the procedure depends on many circumstances. Any of the following methods may be pursued:

First. The heads of the concern get together and decide they want a new foundry. They talk it over and come to the conclusion that when they consider the volume of steel and malleable work they are going to get, their gray iron foundry must provide for about twice the old tonnage. They then decide upon an arbitrary addition to the pattern storage and the pattern shop. In most cases in this council no attention whatever is given to the increased requirements for the storage of flasks, iron, sand, etc. They then decide that a man who has been giving them considerable business and who is connected with an architectural firm should get the job of designing the foundry. The result may be a wonderful structure from an architectural standpoint, but an exceedingly poor machine as a foundry. Such a building places a handicap on the concern as long as it lasts.

Second. The architect may be called in, in the first place, and told to go ahead and "design us a foundry for three times the capacity of that old trap we have got out there." He is to receive 5 per cent of the net cost as his commission, and hence he gets busy and introduces all the new ideas he can. If the firm will stand for reinforced concrete, a lot of heavy crane runways and other special devices, it gets them. Under circumstances of this kind, I have seen a 25-ton crane put into a plant which never handled over 5 tons—but the architect needed the commission.

Under a third procedure, an architect is instructed to put in the kind of a core oven that John wants; to build a melting department—the cupola, platform, etc.—to suit Bill; a brass foundry to suit Tom, and so on. But no one man acts in the capacity of general supervisor to see that these various departments harmonize in regard to handling the material, etc., and as a consequence the architect, through his ignorance of the raw materials required, so locates the various departments as to necessitate a maximum handling charge for all raw materials throughout the life of the plant.

A fourth method sometimes followed is to advertise the fact that the K. & B. Company is going to build a new foundry and will be glad to hear from the equipment men. The result is usually that the man who can talk the best for his equipment gets it in, whether it is needed or not. Fortunately there is a constantly increasing number of equipment men who insist upon selling only that which will make good, so that to-day a foundryman following this course runs less risk than he would have a few years ago.

Mistake as to Handling Materials

No matter which one of the above methods is followed in designing the foundry, in most cases the result is a plant in which no harmony exists in the general scheme of

handling material. It may be taken part of the way on a flat-wheeled truck, then loaded on the industrial railroad and taken through another department in that way; then comes an overhead tramrail and possibly some other form of conveying the machines or devices.

Another serious mistake frequently made is that the provision for conveying material from the plant is such as to require many re-handlings. The manufacturers of furniture, machine tools and many other products learned long ago that stock should never touch the floor where it is possible to avoid this. In plans of this kind the stock is taken off one truck, passed through a machine and immediately loaded on another truck. The foundryman does not yet seem to have wakened up to the advantages of some of the more modern methods of handling material.

Good Ideas Wrongly Applied

Another phase of this subject is just as bad and that is that a foundryman gets some one idea so thoroughly lodged in his head that he tries to apply it to everything. I remember one plant in which I found seventeen different kinds of trucks or carriers in use in the plant, and yet every one of them had a definite function to perform and served to reduce cost in a marked manner. I have seen other plants in which there were eight or ten different kinds of carrying devices, every one of which had apparently been purchased with practically no idea as to how it was going to fit into the general scheme.

The industrial railroad, for instance, is a very convenient means for transporting materials. In the average foundry it serves admirably for bringing pig iron, coke and limestone to the cupola, but an industrial railroad in the gangway of a foundry is generally an abominable nuisance; the turntables are constantly getting full of dirt, the switches give trouble, the track serves as a stumbling block for all other means of transportation, the cars cannot pass each other in the gangway and so on. For light work, a well-made gangway with flat wheeled trucks is certainly a flexible proposition. It requires slightly more power to propel a truck carrying a given weight on flat wheeled trucks than it does on an industrial railroad, but the flexibility will more than compensate for this disadvantage. On the other hand, for all outdoor work the industrial railroad certainly is admirably fitted.

In like manner various other handling devices could be considered in detail, but it would take more space than can be here devoted to the subject.

Apportioning of Space

The melting equipment in any foundry should be considered very carefully. First, the number of mixtures must be taken into account and the amount of each; second, the average-sized mold and the method of transporting iron to the mold. For small, light castings, which must be poured with hot iron, floor space near the cupola is always at a premium and should never be cluttered up with unnecessary devices. With heavy work, which can be poured with colder metal, traveling cranes are generally used and the exact location of the molds is not very important.

This matter of the location of a given thing in a plant bears a direct relation to the value of a square foot of floor space in the department. For instance, in some plants the washrooms and toilets are so located as to prevent the expansion of certain departments into space which is very valuable from a manufacturing standpoint. In other cases, the general layout of the building is such that it prevents such expansion. There is a direct relationship between the weight of casting to be made and the style of roof to be used. Heavy castings demand broad bays and cranes of considerable span, while light work can be made in a building of much cheaper structure and lighter roof.

The modern foundry should be a manufacturing proposition just as fully as a modern machine. The raw materials which this foundry machine is to use are, in the case of a gray iron foundry, pig-iron, coke, limestone, molding sand, core sand and binders; there is also required a certain amount of miscellaneous foundry supplies. The product is castings. The waste, which corresponds to the chips from the metal working machines, is slag, dust cinders from the cupola, cinders from the core oven and waste sand from the foundry. Ordinarily this material is disposed of at once, but modern methods have shown that much of it can be recovered and re-used.

The Foundry as an Efficient Machine

In designing a modern foundry, the engineer in charge should analyze the product just as he would in designing a machine, and should then see that each part of the whole operates in harmony with the rest. Obviously all material should move by the shortest route; there should not be any back-tracking where it can be avoided. For handling patterns there should be a well-studied relationship between the pattern shop, the pattern storage and the foundry. In like manner, the drafting room should be readily accessible from the pattern department. The core department should be so located that the cores are made with the smallest possible handling labor and are delivered to the molders with as few handlings as possible. The castings should pass through the plant in a systematic manner without rehandling. All the various raw materials should be stored as near the place of consumption as possible and should be so handled as to avoid unnecessary delays. In very few foundries have these points received careful consideration.

A Concrete Floor for Heavy Work

A good many incidents could be cited illustrating some features of designing by foremen in connection with manufacturing concerns, but space permits reference to but a few. Some years ago the writer was shown through a foundry which was supposed to be the latest thing in foundry design. The building had just been completed and practically none of the equipment was moved in. As we stood at one end and looked down through the large building, I asked the engineer if they had decided upon the proper arrangement and lay-out of the different departments before going ahead, and he said: "No, our foundry foreman kept trying to put in and tell us what we wanted, but we decided we would have a modern foundry and so we built it." I asked him if any provision had been made for pits for large work. "No, we have plenty of floor space and the foundryman can dig his pits wherever he wants them." When I called his attention to the fact that the part of the foundry in which I thought the pits would go had a concrete floor, which was then rather an innovation in the foundry business, he said: "Oh, that's all right; he can break holes into it wherever he wants to." This plant was the product of an architect and it has proved a very expensive heirloom to its owners.

Costly Wooden Core Plates

Another example, while it does not refer to the designing, shows the sort of thought a new plant receives in some cases. Some years ago a foundry, now no longer in existence, was making an extensive line of work requiring a large number of cores. It was figured that the expense of a complete set of metal core plates would be very great, and so the cores were dried on wooden boards. The ovens were simply tightly closed rooms, with two firepits in the floor. They had a rule governing the amount of coke, which was somewhat as follows: It required a certain number of pounds of coke to heat the oven and a certain number of pounds of coke additional for each wheelbarrow load of sand used in making the cores to be dried in that oven. These fires were started a short time before the oven was closed, and when the coke was well ignited the cores were run in and the oven shut up. The only exit for the products of combustion was through the leaks in the oven walls and around the doors. After about three months' use the boards would become very dry and some of them slightly charred. Then the morning would come when a spark lighted in some of this charcoal and slowly smoldered. The moment the oven door was opened up the boards took fire and

burned very rapidly, ruining every core in the oven, and generally a shutdown for a day. Despite this quarterly visitation of Providence, the plant continued to use wooden core driers for many years.

Customs Decisions

Sewing Machines

The Philadelphia Bag Company was a protestant before the board in regard to a machine for sewing or stitching together burlaps for bagging, which it claimed should be assessed as "sewing machines" at 30 per cent. under paragraph 197. This contention was sustained and the collector's assessment of 45 per cent. under paragraph 199 was modified accordingly. A similar decision was rendered in favor of F. B. Vandegrift & Co., New York, the article in question being a special sewing machine used for the sewing up of the backs of elastic stockings.

Machine Tool Part

Reliquidation will follow in the case of E. Stegeman, Jr., who protested against the assessment of 45 per cent. ad valorem on the base of a power lathe, which had been packed separately from the other parts. The claim was sustained that the iron base should be classifiable at the same rate as the lathe proper, which was assessed at 30 per cent. as "machine tools."

Small Cash Boxes Not Toys

On small and cheap cash or stamp boxes, made of lacquered metal, duty was assessed at 4c. per lb. and 35 per cent. ad valorem under paragraph 195 of the present tariff act but they were claimed by F. W. Woolworth & Co., the importers, to be dutiable as "toys" under paragraph 431 or as "manufacturers of metal" under paragraph 199. The importers held that the scope of paragraph 195 was limited to only such boxes, cans, etc., as are of the character ordinarily employed as containers for the holding and transportation of merchandise, but the Board of United States General Appraisers overruled such a contention and at the same time decided that the goods are not toys.

Steel Wire Rope

Following previous decisions of the board, the Mill & Mine Supply Company, Port Townsend, Wash., has been sustained in regard to an importation of steel wire rope, which was assessed at 35 per cent. plus 1c. per lb. under paragraph 135. The board held that on the basis of the values given for the wire used in the manufacture of the rope, where the specific rate of 1 3/4c. per lb. figured out more than the 35 per cent. ad valorem rate for the wire used, the finished rope should be assessed at 1 3/4c. per lb. plus 1c. per lb., but not at less than 40 per cent. ad valorem. Reliquidation will follow.

Ladles Used for Molten Metal

The board did not think that F. H. Shallus, Baltimore, Md., had offered sufficient evidence to sustain his contention that iron ladles used in the handling of molten metal were properly dutiable at 30 per cent. under paragraph 123 as "forgings of iron, not machined, tooled or otherwise advanced in condition by the forging process." Duty had been assessed at 45 per cent. under paragraph 199.

The plant of the National Rolling Mill Company, Mansfield, Ohio, which has been in the hands of the court since last January, will be sold at auction at the office of the company, September 28, by F. D. Bicknell, trustee in bankruptcy, 505 Chamber of Commerce Building, Cleveland, Ohio. The plant is equipped with three 26-in. mills and two sets of cold rolls, and has a monthly capacity of 1000 tons of sheets.

A meeting of the Bridge Builders' Society was held in the Hotel Schenley, Pittsburgh, September 13. All the concerns represented reported a very active condition of business, with the outlook for the future very bright. The society has prepared a standard specification for railroad bridge work, and it is now in the hands of a committee which will confer with a similar committee from the railroads.

The Old Foundry and the New

New Methods and Improved Equipment Must Be Adopted with Discrimination to Secure Satisfactory Results

BY H. M. RAMP.*

The old foundry, with its crude business methods, its cheap buildings, its makeshift equipment, is passing from us, and the new foundry, with its progressive ideas, its high ideals, its expensive buildings and its fine machinery, is becoming a common and permanent fixture in the foundry world. But with the passing of the equipment and methods of 30 years ago, it becomes us well to review the progress we have made and analyze the practice of the new foundry as compared with the old that we are leaving behind us, and see if much that we regard as progress is not more apparent than real.

Many Traditions and Some Good Practices Shaken Off

The foundry has been compelled to shake off many traditions, many old customs, that almost savored of superstition to the practical analytic mind of today. It has abandoned many things that were done without being able to give a reason for their performance, and in this abandonment of old methods it has eliminated some practices that were productive of good, without replacing them with better ones, simply because our latter day age of reason could not fathom them; hence they were classed as traditional and snugly shelved for methods we could explain.

It has been said that the old foundry was operated without system, without adequate supervision or equipment; that it was often the neglected and sometimes forgotten end of a manufacturing business, and this is true; but has the new foundry, with its elaborate systems, its machines, fine buildings and traveling cranes been a complete success? Do the new foundries built today and equipped with the best the market affords produce castings more cheaply than the old? Do they always produce castings as cheaply as the old? Do they produce better castings than the old? These are the questions whose answers reveal the true progress that the foundry has made, and I believe that, with the exception of foundries that have been built to manufacture exclusively some certain line of work that is duplicated in large quantities, the new foundry does not give the results in a cheapened product that were anticipated. The additional burden or overhead expense, the repair and operation of the improved machinery placed in the new foundry, doing average work, eat up the advantage that has accrued from the use of the improvements.

Room for Far Greater Development in the Molding Art

There should be and there is room for a far greater development in the art of making iron castings, but there would have been greater returns from the improvements that have been made if the makers of these improvements had a more thorough and practical knowledge of the foundry business, or had kept in close touch with those perfectly conversant with the practical details of the business. There have been pioneers and explorers in the foundry trade who deserve much credit for the progressive work they have done, but in its accomplishment they have endured the privations and hardships that come to such.

He who steps aside from the beaten path, be it in the trackless forest or the domain of trade or mechanics, finds no guide posts or road bed to blaze his way; he is the sole architect of his structure, and he must build it upon experience and a practical knowledge of its fundamental principles. But there are many people who believe that because two and two make four every other equation can be performed in the same manner, and the foundry with its enormous field for improvement has been an attractive playground for the ideas and fancies of many of our mechanical reformers and systematizers,

and this accounts in some measure for the failure of the new foundry to give the return it should upon the investment.

These things are not said as a condemnation of the new foundry, but to draw attention to some of the reasons why it fails of greater fulfillment. Most of our foundry improvements have been made either by men possessed of mechanical ability but little practical knowledge of the foundry or for some particular casting, and the latter then manufactured and sold by some promoter to do work for which it was not fitted, and these two very naturally often go hand in hand—the man seeking to improve a business he has not mastered and the man selling to a customer who doesn't know what he wants.

New Foundries Should Be Planned by Practical Foundrymen

It is hard to imagine a mechanical engineer planning the equipment and layout of a foundry when possibly his only experience in the art of molding is watching the sparks fly out of the cupola. It is difficult to see where the system man gathers his data for a foundry system with only a few days' investigation of its practice, and yet I do not believe this remark is extravagant in view of some cases that we have observed. There is room—yes, and necessity—for the engineer and the system man in the foundry, but their knowledge should be supplemented with the skill and experience of the actual foundryman. The lack of co-operation in the planning of the new foundry by those who design its structure and equipment and those practical men who are to operate it has done much to delay the development.

It is true there are not many mechanical engineers in the foundry business, but he who designs a modern plant must see it through the spectacles of the foundryman if he expects to better the performance of the old, and he must realize that, although there are practices which cannot be explained, they are based on the lessons taught by that greatest of teachers, "experience," and over a period of hundreds of years.

We have seen new foundries fail of their promise because of the way they have been laid out; because they were cut up into so many departments that the labor of supervision and moving material consumed all other gain. We have seen foundries built where the expenditure for the floor space possible for production was so small in relation to the cost that the burden or overhead swallowed it. We have seen foundries so filled with undesirable equipment that they could never pay. All these things and more are the mistakes that the new foundry has made, but they can be used as valuable lessons in the future.

Molding Machines Misused and Abused

The molding machine is today probably the new foundry's greatest asset, having been the most valued ally in the progress of its work. But molding machines have been misused and abused in their application. We have seen stripping plate machines used on plain flat work where a squeezer was preferable from every standpoint. We have seen deep complicated castings made on a squeezer where a stripping plate machine was far more adaptable. Thus through the entire molding machine equipment we find so many round plugs in square holes that we wonder who is responsible. Many concerns that have installed machines not adapted for their work have never realized the fact because the machines, even though applied on an improper class of work, showed a gain over hand molding.

The use of the molding machine in the new foundry has made necessary also a greater expense for two items of equipment, namely, better flasks and better patterns.

*General superintendent Modern Foundry Company, Oakley, Cincinnati, Ohio.

These items of expense, however, return a greater dividend than any other expenditure made, and are necessary to both improved quality and cheapened output. But if the old foundry had spent as much money on patterns and flask equipment for hand molding as the machine man demands must be spent for machine molded castings, the molding machines would not show nearly the supremacy over hand molding they do today. It sometimes appears strange that a concern will spend money for an expensive machine that requires power for its operation, repairs for its maintenance, expensive patterns and flasks to develop its usefulness, and yet refuse any equipment but the cheapest if the casting is made by hand. It may be that some concerns are like the man who won the elephant at a raffle.

Molding Machines Should Be Adapted to the Work

These criticisms are not intended to discourage the use of machines, but to direct attention to the fact that it takes some foundry experience to purchase the best machine for any particular class of work. There is no such thing as a universal molding machine, adapted to all classes of castings, and no more chance of building one than there is of the machine shop building a tool that would economically combine the performance of the lathe, planer, drill press and milling machine.

There are also many foundries spending money for machines, mounting patterns, and making special equipment for them, that will not pay for the investment on part of their work in 10 years, if ever, because of the light demand for these particular castings. It were well to ascertain first the probable cost of mounting each individual pattern upon the machine, the estimated saving, and the output per year before incurring this expense, for here is one of the places where the old foundry comes out ahead.

It is very easy to be carried off one's feet with the idea that a machine-molded casting is a cheap one, but it is not necessarily true. It is only cheap when, in figuring the saving, the reduced price multiplied by the output shows a gain over the added cost of interest and depreciation on equipment and repairs and power for operation. How many owners include these items of expense when they figure the saving that the machine has made in their foundry?

The molding machine business is still in the kindergarten class. There is an enormous field for development and progress, however, and it will surely come. It is, of course, understood that these remarks are not intended to apply to pioneers in the business who have spent years of patient effort in developing machines suitable for their own needs.

The Function of the Traveling Crane

The advent of the traveling crane into the foundry was hailed as a great improvement; and it was, but not so much as was popularly supposed—in a financial sense. The old-time jib crane was cheap to erect, cheap to maintain and operate and was so limited in its area of service that it was rarely overcrowded with work. But the traveling crane, because of its more rapid service, the heavy initial expense—both for itself and the building to support it—is generally expected to cover more area and render more service than its increased speed and facility of operation permit.

While the service is fine when the workman gets it, sometimes it reminds one of the congestion that would exist along the New York Central if it ran only one passenger train a day. Not only is it expected to give a service greater than it is possible to perform, but how often we have seen a ponderous 10 or 15-ton crane run 200 or 300 ft. and change lifting equipment to pick up a piece weighing 300 lb. When the crane was purchased the question asked was, "What will be your maximum load?" And the crane was specified accordingly, not considering that the maximum load presented itself only once in a hundred times and the great mass of service was one-fourth or perhaps one-tenth of that.

This is not the fault of the crane, but the fault of those who planned the service. A close study of the old foundry would have been of great value to the man who has built a foundry and equipped it with a couple of 10-ton travelers to do all the work. The old foundry had its strong cranes, its lighter cranes, its wall cranes, its

trolley tracks, all as the work demanded, and put the light work under the light rapid equipment and the heavy work under the strong, slow moving cranes, and the modern foundry would do well to consider why such lifting devices were built by the old foundry when planning to improve upon its performance. It is not intended to suggest a nondescript collection of crane appliances for a modern shop, but it most certainly is not progress to use a locomotive to push a handcar.

The lesson to be learned is simply this: When you depart from the old régime don't let paper figures alone convince you. Find out why a thing was done in a foundry in a certain way before abandoning it. The old foundrymen studied the laws of cause and effect for hundreds of years. Don't stand still, but find out why things were done the old way before jumping into a new method that has no recommendation except that it is new.

Canadian Steel Makers and Their Tariff

In an interview about the industries of the Lake Superior Corporation, of which he is president, T. J. Drummond says:

"We have had under consideration certain extensions of our iron and steel plant, but we have decided to postpone definite action in the meantime, pending possible consideration and action by the Dominion Government in regard to the iron and steel tariff.

"The existing tariff on iron and steel is so torn up by special dispensations, exemptions and rebates, that the progress of the industry is retarded, and in many cases made absolutely impossible. Under the existing tariff we are encouraged to manufacture in small lines, giving small tonnage, and then discouraged in progression into the manufacture of heavier sections, which give larger tonnage. In other cases industries are practically bonused to purchase their pig iron, merchant steel, etc., abroad, and so in one way and another the industry is hampered, and the tariff is in many cases by these exemptions made absolutely illogical and inconsistent.

"If the iron and steel industry is to go forward this tariff must be overhauled, and such matters as I have referred to must be dealt with in a common sense manner, and especially in connection with pig iron, merchant mill-products and structural steel. At present practically 1,000,000 tons of iron and steel is annually being brought into the country, and the bulk of this tonnage could and should be made in Canada. We placed our case before the Government during the last session of Parliament, and we are hoping that something may be done this session, but pending the outcome of what consideration the Government is giving to our case, we can only mark time and hope that such action will be taken as will warrant us in going ahead with the extensions we have in view."

The Peterson-National Company, Buffalo, N. Y., formed by the consolidation of the National Core Oil Company of Buffalo and the foundry supply department of the T. J. Peterson Company of Chicago, as mentioned in *The Iron Age* of September 12, has completed arrangements for the establishment of an additional plant at Buffalo. A factory building, 50 x 150 ft., of brick, at Hamburg street and the Lake Shore Railroad, with switching facilities, has been leased for a term of years and will be fitted and equipped for the manufacture of dry core compound pastings and general core room supplies. The former factory of the National Core Oil Company at Alabama street and the Erie Railroad, for the manufacture of core oil, will continue to be operated as at present.

The Associated Foundry Foremen's Association of Philadelphia held its regular meeting, following the summer vacation, in Columbia Hall, in that city, on the evening of September 11. Robert N. Gross, of the Pennsylvania Steel Company, read an interesting paper on "Nickel Chrome Pig Iron."

The new lake freighter, the *James A. Farrell*, being built for the Pittsburgh Steamship Company, will be launched September 28 at the Lorain yards of the American Shipbuilding Company.

A Brief for the Jolt Ramming Machine

Hints for the Foundry Superintendent Regarding the Scope of Use and Efficient Handling of One Form of Molding Machine

BY JOSEPH F. HART

To accomplish the best results with molding machines the person superintending them must have a thorough knowledge of every operation involved in making molds for a great variety of castings and the working conditions most favorable to rapid work. This applies more to jolt ramming machines than to any other phase of modern foundry practice. Only one who has seen a great variety of work made in many different ways can realize the possibilities of these machines or utilize them to the fullest extent.

Large Rather than Small Machines Preferred

In selecting a jolting machine, simplicity and strength are the main points to consider. Comparison of the various makes by an engineer is advised. Medium large sizes are most desirable, depending of course on the class of work to be handled. Small jolting machines have less comparative productive value than large ones, but several molds of small area can be jolted on a large machine at one time. The extreme larger sizes, however, are only desirable in extraordinary cases.

As a rule there is little or no economy in jolting shallow flask parts or very small flasks. The larger and deeper the flask happens to be the greater the saving effected by the use of the jolting machine. Thus, a cope 6 ft. square but only 6 in. deep could be jolted at a profit. Going still further, a cope of the same area with a depth of 4 ft., if adapted to these machines, would show a saving of 90 per cent. in the time necessary for ramming compared with other methods, and the ramming would be of a superior quality.

Flasks less than 30 in. square and not more than 8 in. deep can be handled with greater economy by other methods, though there are many castings of small area but of considerable depth which show a wonderfully low cost when rammed on the jolting machine and handled properly; for example, any castings of the nature suggested by Figs. 1 and 2, measuring 6 x 6 in. in cross section and 30 in. long. In ordinary practice such work would be made four pieces to the mold in flasks 20 in. square. To adapt such work to the jolt ramming machine, we would use flasks 40 in. square, put 16 patterns in a mold and, if ordered in sufficient quantities, jolt up two molds at once, in this way getting 32 pieces in less time than four could be rammed by hand, and the castings would look better and weigh less. If such a job is required only in small quantities the small flask with the four patterns may be taken and jolted with some other job at the same time.

Molding on End Instead of Horizontally

In Fig. 3 is shown a well-known rolling mill casting, the smaller sizes of which are ordinarily molded from a split pattern and cast in a horizontal position, one in a mold. It requires very little intelligence to realize the saving effected by molding such a casting on end and jolt ramming four, eight or twelve in less time than needed to make one by hand. The lines suggested are

where a master foundryman is most required and where some surprising improvements can be made; that is, in molding on end castings which from time unknown have been molded horizontally. The main problem here is: Can such a pattern with reasonable alterations be drawn from the sand endways, and can necessary cores be set as easily?

Deep spur gears, rolling mill coupling boxes, packing rings and driving boxes for locomotives are other small jobs which can be rammed to advantage on the jolting machine. In foundries where such work is recurrent locomotive driving wheels, and, in fact, any balance wheels, blank gears, etc., can be molded 25 per cent. cheaper on the jolt ramming machine than by any other method yet introduced.

A cylinder liner for a locomotive is shown in Fig. 4. This is a job particularly suited to jolt ramming. Even when a solid pattern is used a mold can be rammed much better and quicker than by hand; also if a whole core-box can be had and the core made on end, it can be jolted at the same time as the mold. Shops making these liners regularly, however, should use a pattern and flask as shown. Here only a one-piece flask is used, core and mold being rammed at one time. The flare end of the pattern and the use of runner cores do away with the need of a cope and form a pouring

basin as in pipe foundry practice. On a job of this nature the bedding-in method should be used to save time and labor. The ramming, of course, must all be done by the machine.

Competing Successfully with Loam Molding

Following similar lines further we come to some simple cylinders, condenser castings, large size annealing pots, etc., commonly molded in loam. Wherever this work is made in sufficient quantities to warrant the use of patterns, these castings, if made in dry sand molds, can be jolt-rammed to show a reduction in molding cost that many foundrymen would say was impossible. The patterns needed for this class of work are not necessarily expensive, but should always be made so that core and mold can be rammed at the same time. Loose pieces, nozzles, etc., must be allowed for, either with dove-tailed slides or so blocked off that a molder can attend to them after the mold has been removed from the machine.

Cores of large diameter should be made hollow. Thus a core 60 in. in diameter requires a wall only 6 in. thick, if properly secured. Castings of great depth can be molded in sections to come within the capacity of the machine.

Practically all medium and large size split pattern work can be adapted to the jolt ramming machine, especially large size pipe fittings, valves and cylinders of almost any style for air, water, gas or steam, piston valves of the

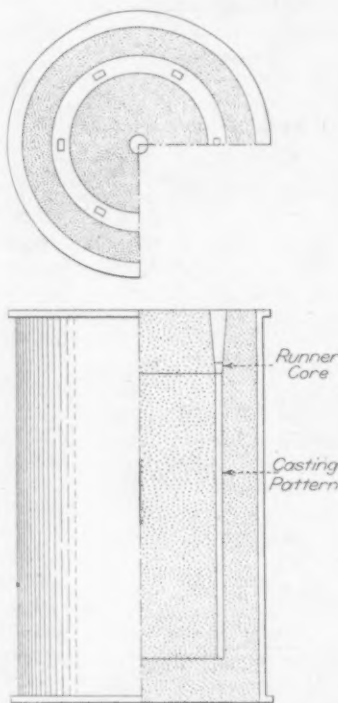


Fig. 4—Mold of Cylinder Liner

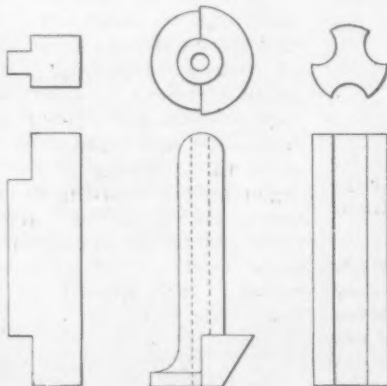


Fig. 1 Fig. 2 Fig. 3
Castings Suited to Jolt Ramming

slide valve or Corliss type. Half a pattern is often sufficient.

Dispensing with Bottom Boards

When making flasks for use with the jolting machines, the use of bottom boards or plates should be dispensed with as far as possible in favor of cross bars. In jobbing foundries use only straight bars, as shown in Fig. 5. The cope and drag should be alike for split patterns, grids being used to carry the hanging sand. Well-made hook gagers can be hung in slots A. By following this rule any flask can be used for any pattern that will fit inside of it, no picking or choosing being necessary.

When a jolt ramming machine is installed it should be allowed plenty of room on all sides. If one of these machines is placed in a corner its capacity is reduced by one-half. To get the fullest return from these machines one must provide for the different sizes of flasks used and frames of sufficient depth to hold all the sand required to fill the flask when rammed. Flasks should be rammed before being lifted on to the machine, and the ramming completed as far as possible by the machine without further attention. Butt ramming can often be partly or wholly dispensed with by the judicious use of a few pieces of pig iron or especially designed weights.

Getting the Most Out of a Machine

After the first mold is jolted, in the morning, there should be no stopping the machine until quitting time. But as soon as one mold is taken from the machine another should take its place immediately, and no work whatever should be performed on a mold while holding the machine, except what the machine is meant to do, the idea being to accomplish all the ramming the machine is capable of. The finishing, core setting and casting are entirely different matters calling for only generally improved foundry practice.

Gang work is most desirable when using the jolt ramming machines, and is really a necessity to reach the greatest efficiency. Thus, by having a few molders attend to all the ramming, material and labor can be concentrated

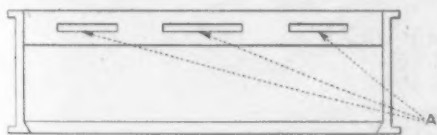


Fig. 5—Arrangement for Using Bars Instead of Bottom Boards

in a smaller area. Furthermore there is an advantage in having the men specialize on certain portions of the work. Start the ramming gang an hour or two earlier than the rest, to be ready for the finishers.

The jolt ramming machine has, of course, met with the same reception in some foundries as other molding machines. Someone gets it into the shop, someone tries it out in a half-hearted manner, perhaps for a mold or two, and that is the end of it. Lay the work out in proper shape for the machine in the first place, and then see that the machine is used and used to the limit.

New Publications

The Basic Open-Hearth Steel Process, by Carl Dichmann. Translated from the German by Alleyne Reynolds. Pages, 334. Published by D. Van Nostrand Company, New York. Price \$3.50 net.

This is an exceedingly interesting and valuable book, both to the theoretical and the practical man. For the former it gives exhaustive and thorough discussions, formulae, and tables relating to the chemical and thermal phases of open-hearth furnace conditions and reactions—one of the clearest presentations of these complex subjects that has appeared. And though labeled "basic" it is also valuable in acid furnace practice. To the practical man it is useful in that it contains chapters dealing with operating phases and conditions—chapters quite free from mathematical and theoretical discussions. It is evident that the author is not purely theoretical, but has had actual furnace experience.

The book is divided into two parts. Part 1, consisting of sixteen chapters, deals largely with the stoichiometrical and thermal problems of producer gas, though there are some discussions easily understood by the practical man or the student. The theory of gas producer working is considered and the conditions governing the complete utilization of fuel. Many interesting results are detailed. The use of oil fuel is not discussed at all, and in this respect the book lacks interest to many American furnace men who use oil and natural gas.

Part 2, consisting of eight chapters, treats of the chemistry of the basic open-hearth process. The portion that deserves special mention is chapter 18, which deals with "The Chemical Action of the Flame," and discusses the complex quantitative and thermal conditions and equations of slag formation. This is a detailed and exhaustive treatment of a very important phase of open-hearth practice, it being generally acknowledged that most practical men and many well versed in theory do not thoroughly understand the important conditions governing the formation of proper slags and the influence these have on the production of metal of good quality, whether basic or acid.

Of special interest is chapter 21, on "The Occurrences in Open-Hearth Furnaces and Their Estimation." In a later chapter the different methods of working the basic open-hearth process, such as the "Pig and Scrap Process," "The Scrap-Carbon Process," "The Pig and Ore Process with Solid Charges," "The Pig Iron Process with Molten Charges"—covering the Talbot, the Bertrand-Thiel and the Monell processes—are all treated from a practical and theoretical point of view. A concluding chapter discusses "The Open-Hearth vs. the Pneumatic Refining Process." An appendix embraces a résumé of all calculations in the treatise.

The book is written largely from a German point of view relating to German conditions, where basic practice predominates. Nevertheless, American conditions are touched upon and American works, especially H. H. Campbell's book, are quoted from frequently. German thoroughness is in evidence in the treatment of every subject.

E. F. C.

Valves, Valve Gears and Valve Diagrams. By Franklin De R. Furman, bound in cloth. Size, 8 x 10; pages, 130; 152 illustrations. Price, \$3.75. Published by the author, Stevens Institute, Hoboken, N. J.

The book is the outgrowth of a set of notes prepared by the author about eight years ago on the subject and revised every year or two since. When preparing these notes for publication about 20 per cent. of the material, both in the text and the illustrations was added. The material in the book comprising the drafting room problems has been arranged for class room and recitation work after extended visits to drafting rooms in which the work of the design of valves and valve gears was being carried on in a practical way. Although the arrangement of the material is such that would best fit in with the general course of mechanical engineering at Stevens Institute, and while many suggestions from various sources have been adopted there have been some features introduced which are original in their conception. Among these may be mentioned the introduction of numbers marking the order of the drawing of lines in the construction of valve diagrams in the early exercises, the formula for determining exactly the steam lap by the Zeuner diagram, the introduction of preliminary freehand problems before taking up the regular drafting room work, the combining of the valve ellipse with the steam engine indicator card to determine the steam and exhaust laps, steam and exhaust port openings and the lead while the engine is in service, the method of determining the proper width of cut-off blocks for various valves, and a condensed arrangement of Auchincloss's method of design of the Stevenson link motion. The Baker valve gear for locomotives, the Lentz gear for stationary engines and the Curtis and Westinghouse gears for steam turbines are among the recently developed methods of steam control which have been included.

The book is divided into five sections dealing with the simple steam engine, valve diagrams, types of valves, eccentrics and shaft governors and valve gears respectively. The various points in connection with these subjects are taken up in a logical way and the text is supplemented by a number of line drawings.

Personal

On the evening of September 13, Frederick A. Geier, president of the Cincinnati Milling Machine Company, Cincinnati, Ohio, gave a dinner to some of his friends and business associates in celebration of the twenty-fifth anniversary of his connection with the company. Toasts appropriate to the occasion were responded to by a number of the guests, which contributed largely to the pleasure of the evening. The following were present: Ernst Krause of Vienna, F. W. Jaeger of New York, C. Wood Walter, A. L. DeLeeuw, C. S. Gingrich, E. M. Chace, P. O. Geier, H. M. Ramp, A. H. Tuechter, Sherman Schauer, B. B. Quillen, J. C. Hobart, P. G. March, Murray Shipley, William Lodge, Dr. Otto P. Geier, H. T. Atkins, George Puchta, Fred Holz, Sr., George H. Bohrer, Louis S. Levi, Prof. Herman Schneider, Louis J. Hauck, James P. Orr, George D. Crabbs, Prof. F. C. Hicks, Dr. J. M. Withrow, Nelson W. Strobbridge, Robert Hochstetter, Alfred Marshall, George E. Merryweather, E. F. DuBrul, Dr. C. W. Tangeman, Albert Bettinger, Lewis N. Gatch, Frederick V. Geier, George H. Kattenhorn.

V. H. Hughes has been appointed assistant state geologist of Missouri. The headquarters of the Bureau of Geology and Mines is at Rolla, Mo.

W. H. Pratt, general superintendent North Works, Illinois Steel Company, has returned this week from a three months' trip spent with his family in motoring through Great Britain and on the Continent.

William H. Laib, formerly vice-president and secretary of the Hanna Engineering Works, has resigned to become secretary-treasurer of the Reynolds Electric Flasher Mfg. Company, Chicago.

A. S. McEldowney, formerly in charge of the mill order department, has been appointed purchasing agent for the Scully Steel & Iron Company, Chicago, succeeding W. H. Dangel, resigned.

B. A. Brennan has resigned as sales manager of the power department of the Bethlehem Steel Company to accept the office of manager of the corporation department of the Mercantile Trust Company, St. Louis. He entered upon his new duties September 10.

Harry Schleining, formerly of Neal & Brinker, is now connected with Walls, Bray & Co., machinery, tools and supplies, 83 Walker street, New York City, in their sales department.

J. C. Potter, of the Potter & Johnston Machine Company, Pawtucket, R. I., has returned from a two months' European trip.

W. C. Runyon, Cleveland, president Struthers Furnace Company, Struthers, Ohio, has returned from a two months' automobile tour through Germany and France.

Carl A. Buse, Cincinnati, has been appointed auditor of the Tool Steel Gear & Pinion Company, Carthage, Ohio.

H. M. Ramp, general superintendent of the Modern Foundry Company, Oakley, Cincinnati, Ohio, is recovering from a severe illness.

C. P. Williams, formerly Boston representative for the Chicago Railway Equipment Company, has become associated with the National Lock Washer Company, with offices at Chicago.

R. J. Sheridan has been appointed Eastern representative of the Chicago Railway Equipment Company, with offices at Boston, succeeding C. P. Williams resigned.

Frank Wright, works manager of the Indiana Harbor plant of the American Steel Foundries, has resigned and will, on October 1, become works manager of the Ohio Steel Foundry Company, Lima, Ohio.

W. S. Bidle has resigned as manager of the turnbuckle department of the Cleveland City Forge & Iron Company, Cleveland, Ohio, and as secretary and treasurer of the Cleveland Car Specialty Company, an allied concern, which positions he has held for a number of years. He will take several months for rest and recreation before re-engaging in business. Joseph A. Costello, who has been assistant manager, succeeded Mr. Bidle as manager of the forge company and as secretary of the car specialty company. Ralph M. Coe has become treasurer of the latter company.

Hollinshead W. Taylor of the N. & G. Taylor Company, tin plate manufacturer, Philadelphia, returned from a trip abroad September 11.

J. McA. Duncan has been appointed sales manager of the Westinghouse Electric & Mfg. Company for the Pittsburgh district, in place of W. F. Fowler, who resigned to accept a position with the W. S. Kuhn Corporation. Mr. Duncan has been in the employ of the Westinghouse Electric & Mfg. Company for about 25 years, and is one of the original group of eight men from the Union Switch & Signal Company, then located in Garrison alley, Pittsburgh, to form the Electric Company which was established at the same place.

Clyde P. Craine has been made manager of sales of the Pittsburgh Shafting Company, Detroit, Mich., succeeding Harold G. Willson, deceased. Mr. Craine has been identified with the iron and steel trade for a number of years, and for the past two years has been connected with the sales department of the company named, which is the distributor for Michigan of the products of the Columbia Steel & Shafting Company, Pittsburgh, manufacturer of turned and polished shafting, cold drawn screw stock and special shapes.

Sir George Croydon Marks, member of Parliament, but best known in this country for his researches in hydraulic machinery, is now in this country for a brief stay and is stopping at the Hotel Belmont, New York. He is the author of "Hydraulic Power Engineering."

A. A. Fowler, of Rogers, Brown & Co., New York, returned this week from a four months' European trip.

Henry W. Jacobs, who was advanced to the presidency of the Oxweld Railroad Service Company from the position of assistant superintendent of motive power of the Atchison, Topeka & Santa Fe Railroad, has also become director of mechanical matters for the Jacobs-Shupert U. S. Fire Box Company. Serving an apprenticeship in the foundry and machine shop and later being connected as designer with the engineering department of the Navy at Washington, he was successively in the employ of two important electrical companies and general manager of the Vulcan Engineering Company, New York. His railroad service began in 1900 with the Chicago, Burlington & Quincy Railroad, and in 1904 he became engineer of shop methods for the Santa Fe. He is 38 years of age.

Leonard Peckitt, president Empire Steel & Iron Company, Catasauqua, Pa., is making a trip to the Pacific coast.

Obituary

E. GAITHER HUYETT, an agent in Brazil for the Standard Steel Car Company of Pittsburgh, was killed September 9, in an accident in Rio de Janeiro. He was 42 years old and had been connected with the Standard Steel Car Company more than 10 years. News of his death was received by William Bierman, secretary of the Standard Steel Car Company, in a cablegram from A. L. G. Doty, an associate of Mr. Huyett. Last June the company opened offices in Rio de Janeiro and Mr. Huyett was assigned there. He arrived at his post July 9 and was joined later by Mr. Doty. He was a member of the Pittsburgh Athletic Association.

WALTER A. CRANDALL, treasurer and general manager of the Rhode Island Tool Company, Providence, R. I., died September 6, aged 63 years. Born in Royalston, Mass., he became a resident of Providence when a child. Completing his education in the public schools, he entered the employ of the Providence Tool Company, the name of which was changed in 1883 to the Rhode Island Tool Company. In his 47 years of service with the company, he advanced step by step, and in 1897 was made treasurer and general manager. He leaves a widow and two daughters.

E. H. SYMINGTON, Chicago, Western representative for the T. H. Symington Company, Baltimore, died September 5, following an operation made necessary by an accident of several years ago.

In August the pipe mills of the Republic Iron & Steel Company, Youngstown, Ohio, turned out 12,474 tons, ranging in size from $\frac{3}{4}$ to 12 in. in diameter. The largest previous month's record at this plant was about 12,000 tons.

New Tools and Appliances

This is essentially a news department for which information is invited.

Radial Drilling Machine.—The discarding of a belt feed for a geared feed of the drive-key type is the special feature characterizing a new design of radial drilling machine which has been recently brought out by the Fostick Machine Tool Company, Cincinnati, Ohio. The feed box has a direct-reading index dial and an automatic safety stop trips the feed when the spindle has reached the lowest position of its traverse, thus eliminating one source of breakage. Other changes made include an increase in the power, of the reverse and rapid traverse frictions and the employment of steel for all the important gears, together with the substitution of a box table for the round type formerly supplied. Any one of five styles of table can be furnished if desired, and either an adjustable or a constant speed motor drive can be arranged for, although the standard machine is belt driven. The tool is built with 2½ and 3-ft. arms and the two sizes will drill to the center of 60 and 72-in. circles respectively. The spindles of both sizes are reamed to conform to the Morse No. 4 taper. The amount of floor space occupied is 74 x 82 in., and the over-all height is 118 in.

Boring and Drilling Machine.—A recent addition to the line of drilling machinery built by the Moline Tool Company, Moline, Ill., is a heavy type boring and drilling machine for boring rods and handling similar work. The drive is of the builder's standard double spiral drive, but instead of having the lower spindle bearings adjustable vertically, the spindles run through the lower bearing full size. This bearing is bushed with bronze and is split so that the spindle wear can be taken up, thus giving practically a lathe spindle construction. The upper bearings are threaded and provide a vertical adjustment for the spindles. The heads are planed and scraped, and, if desired, can be equipped with tie rods and spacer washers for setting them accurately to any distance along the rail, but this ordinarily is not required as the heads can be securely clamped in any position. The spindle can be furnished with the Morse taper extending entirely below the bearing and with a regular driving slot, or with short hollow spindles so that a knock-out rod can be used. In the latter case the Morse taper extends up into the bearing. Two styles of table, a plain one having five T-slots and one having three T-slots and entirely surrounded by an oil groove are furnished, the former being used for cast-iron work and the latter for steel. Either type of table is counter-balanced and is fed by double steel racks and pinions, the latter being cut integral with the feed shaft, which is driven by steel and phosphor bronze spiral gears. An automatic trip, a spring down stop and a positive depth gage are furnished with the table. The hand feed is back geared and for facing operations the automatic trip can be set to disengage slightly ahead of the depth gage. A quick return for the table is secured by pulling the pilot wheel out.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

BUYER'S ACCEPTANCE OF MACHINERY.—Where an agreement for a sale of machinery to be shipped from Wisconsin to Montana provided for delivery f. o. b. Beloit, Wis., and that if the buyer rejected the machinery or failed to pay therefor he should return it f. o. b. Beloit, the buyer's refusal to return the shipment unless the seller should refund the freight prepaid constituted an acceptance, rendering him liable for the price. (Montana Supreme Court Berlin Machine Works vs. Midland Cord & Lumber Company, 123 Pacific Reporter 396.)

RECOVERY ON BREACH OF CONTRACT TO BUY MANUFACTURER'S OUTPUT.—On breach of a contract to buy a manufacturer's entire output during a fixed period, by the buyer notifying the seller that no more goods will be received, the seller is entitled to finish and recover the price of goods in course of manufacture when the notice is given, aside from the general damages recoverable on account of the breach. (New York Supreme Court, Second Appellate Division, Stroock Plush Company vs. Talcott, 134 New York Supplement, 1052.)

SALES BY SAMPLES.—A contract to sell goods by sample implies that the buyer shall be given an opportunity to inspect before accepting delivery. Receipt of the goods before such opportunity has been had does not constitute a binding acceptance. But the buyer cannot accept part of the shipment under a single and divisible contract and reject the other part. (United States Circuit Court of Appeals, Ninth Circuit, Meyer vs. Everett Pulp & Paper Company, 193 Federal Reporter 857.)

EFFECT OF REBATE CONTRACT.—Agreement by a manufacturer to pay a rebate on all goods bought from him during a given period, if the purchaser shall buy exclusively of him, does not bind the manufacturer to sell at a reasonable price, where he expressly refuses to agree to meet competitive prices. (United States Circuit Court of Appeals, Ninth Circuit, Long Syrup Refining Company vs. Corn Products Refining Company, 193 Federal Reporter 929.)

DAMAGES RECOVERABLE FOR DELAY IN DELIVERING MACHINERY.—The buyer of a machine to be used in manufacturing a staple product can recover from the seller the amount of his profits lost through the latter's failure to make delivery within the time fixed by the contract. (United States Circuit Court of Appeals, Second Circuit, H. Koehler & Co. vs. York Mfg. Company, 193 Federal Reporter 981.)

LIABILITY FOR INJURY TO HELPER AT TRIP HAMMER.—If a helper at a trip hammer did not know it was defective, and he had not been given instructions concerning his work, except that he was to follow the operator's directions, he did not assume the risk of the hammer accidentally falling while his hands were under it, in performing his duties under directions of the operator. He had the right to assume that the operator would not direct him to do an unsafe thing. (Iowa Supreme Court, Murphy vs. Bettendorf Metal Wheel Company, 133 Northwestern Reporter 349.)

RIGHTS UNDER LICENSES TO USE PATENTS.—A contract licensing the use of patents in manufacturing and selling machines may validly restrict the prices at which the machines shall be sold. Use of the patents in violations of conditions imposed upon the licensee constitutes him an infringer, *e. g.*, conditions requiring certain prices to be maintained and trademark plates to be attached to each machine sold. (United States Circuit Court, Eastern District of Michigan, Indiana Mfg. Company vs. Nichols & Shepard Company, 190 Federal Reporter 579.)

TIME FOR DELIVERY UNDER CONTRACT OF SALE.—If an agreement for a sale of pipe did not provide when delivery should be made or that it should all be delivered at one time, and upon delivery of part the buyer wrongfully refused to accept it, not excusing his refusal through failure to receive the full quantity at one time, the seller could regard the contract as broken and sue for the agreed price of the quantity delivered. (Texas Court of Civil Appeals, Mound Oil Company vs. F. W. Heitmann Company, 148 Southwestern Reporter, 1187.)

SELLER'S REMEDY ON BUYER'S REFUSAL TO RECEIVE MACHINERY.—When a buyer of machinery to be manufactured countermands his order after the machinery is ready for shipment, refusing to receive and pay for it, the seller can sell it and recover as damages the difference between the price it brought and the contract price. (Texas Court of Civil Appeals, Palestine Ice, Fuel & Gin Company vs. Walter Connolly & Co., 148 Southwestern Reporter, 1159.)

REMEDY OF DISSATISFIED BUYER.—Where a machine is sold on an understanding that the buyer shall not be required to pay the price until satisfied with the machine's operation, if dissatisfied his remedy is limited to a rescission of the contract and surrender of the machine or retention of it and reliance on a claim for damages caused by any breach of the seller's contract. (New Jersey Court of Errors and Appeals, Potter Printing Press Company vs. Newark Daily Advertiser Publishing Company, 83 Atlantic Reporter, 969.)

RISKS ASSUMED BY WORKMAN.—Danger of being injured through exhaustion resulting from working overtime is a risk assumed by an employee. (Arkansas Supreme Court, Furlow vs. United Oil Mills, 149 Southwestern Reporter, 69.)

RESPONSIBILITY FOR FAILING TO GUARD MACHINERY.—Before an employer can be held liable for injury to a workman, through disobedience of a statute requiring dangerous machinery to be guarded, it must appear that the accident was directly caused by such omission of duty. (Indiana Appellate Court, Model Automobile Company vs. Sterling, 99 Northeastern Reporter, 51.)

The Machinery Markets

A healthy state of affairs is observed in the machinery trade throughout the country. In practically every selling or manufacturing center pending business is very promising and the aggregate of transactions closed has made the first half of September run ahead of the same period a year ago. Demand from general industry has occupied most of the attention in New York, where, as elsewhere, inquiries are very good. In New England improvement continues and some railroad buying is promised. The demand in Philadelphia has been best for electric power equipment. Chicago as a result of a spell of extreme heat felt a slackening in demand, but is looking forward to the closing of some big lists. Trade generally has continued to come out in satisfactory volume in Cleveland, and Cincinnati has before it several lists of requirements, including some from railroads. Detroit did well, principally in sales of single tools or small lots and there also good inquiries are appearing. There is no complaint from St. Louis, although sales of large size have been lacking. Numerous inquiries are coming out in the Central South, while Birmingham reports a strong market with probabilities of an early heavy demand from the lumber interests. Business created by irrigation projects and public service improvements continues unusually heavy in Texas. The Pacific coast is not only figuring on some large railroad lists, including that of the Western Pacific, but is profiting by a demand which results from greater activity in lumbering. Second-hand machinery is selling well in the New York market, some good sales having been made of extra heavy tools in particular.

New York

NEW YORK, September 18, 1912.

There is little change to be noted in the trade situation in the New York market. Since the last report there have been a few less transactions closed than was thought probable, yet business in the first half of this month reached satisfactory figures and with most houses ran substantially ahead of the corresponding time of last year. Furthermore, the business pending continues to be of the promising kind, and September will take its place with other good months of trade. The demand is almost exclusively from manufacturers, but the railroads will undoubtedly be a livelier factor in the market this fall. Among companies reported in the market for one or more machine tools are the Frick Company, Waynesboro, Pa.; the American Locomotive Company, for its Montreal plant, and the Crane Motor Car Company, Bayonne, N. J. The trade in outdoor equipment is stimulated by the big subway extensions either under way or soon to be undertaken in the city of New York. Firms which manufacture cranes report that the domestic demand for locomotive cranes is particularly good, while there have been excellent shipments of this type to South America and to Japan.

The Iron Age has received a communication from the Manitoba Bridge & Iron Works, Ltd., Winnipeg, Man., stating that the company will be in the market the coming winter for equipment for a bridge and structural shop having a capacity of two to three tons per month. The company is desirous of receiving information concerning the latest punching, shearing, sawing and riveting machinery for structural work. H. B. Lyall, secretary-treasurer of the company, signs the letter asking for information.

The Ox Fiber Brush Company, New York, is having plans prepared for a manufacturing plant which it will build at Albany. Day & Zimmerman, 608 Chestnut street, Philadelphia, are the architects.

S. A. Cook & Co., Medina, N. Y., are having plans prepared for an addition 84 x 250 ft., three stories, which they will make to their furniture factory.

The Vetter Mfg. Company, Irondequoit, N. Y., has been incorporated with \$30,000 capital stock to manufacture office furniture, filing devices, etc., and will equip a factory for the purpose. A. G. Vetter, Irondequoit, and W. C. and E. L. Vetter, Rochester, N. Y., are the directors.

The Walden Knife Company, Walden, N. Y., will build a new plant comprising 20 buildings, all one story, of structural steel, brick and stone, with concrete floors. The main building will be 43 x 200 ft.

The Imperial Textile Company, Utica, N. Y., A. F. Spitzli, president, has purchased a site at Washington Mills and will build and equip a factory 50 x 80 ft., two stories. Knitting machinery and equipment will be installed.

The Adirondack Electric Power Company, Utica, N. Y., will remodel its power house on the Mohawk River and provide additional equipment.

The Utica Gas & Electric Company, Utica, N. Y., has let general contract to R. Richards & Son, Utica, for the construction of a power house at Iliou, 23 x 32 ft. and 10 x 20 ft.

A new shop building 40 x 130 ft. is to be erected in the yards of the state prison at Auburn, N. Y. The plans have been approved by the New York State Prison Commission.

The Cudahy Packing Company, Chicago, Ill., has leased the plant of the Fredonia Preserving Company, East Main street, and the Dunkirk, Allegheny Valley & Pittsburgh Railroad, Fredonia, N. Y., and will refit it for a grape juice factory, installing new machinery. Charles Pringle, Fredonia, will be general manager.

The Chalmers Knitting Mill Company has let the general contract to the B. F. Smith Construction Company, Pawtucket, R. I., for the building of its plant at Amsterdam, N. Y. The plans call for a mill 50 x 300 ft., four stories and basement. Warehouse, 70 x 90 ft., four stories and basement. Dye house, 58 x 83 ft., two stories, and an office building, 59 x 62 ft.

The Fulton Machine & Vise Company, Lowville, N. Y., is receiving bids for two additions, 50 x 50 ft. and 30 x 20 ft., respectively, each two stories, which it will make to its foundry plant.

The Cliff Paper Mill Company, Niagara Falls, N. Y., is adding a factory building 48 x 132 ft., three stories, to its plant on the Hydraulic Power Canal Basin.

The Canadian-American Pulp & Wood Product Company, Niagara Falls, N. Y., recently incorporated, has commenced the construction of a large grinder plant on the north end of Tonawanda Island in Niagara River at North Tonawanda, N. Y. A conveyor 40 ft. high and 300 ft. long will be built in connection with the grinding plant, which will be operated by electric power from Niagara Falls.

Spencer Kellogg & Sons, Buffalo, N. Y., manufacturers of linseed oil, are rebuilding their elevator A. with a steel and concrete structure and will equip it with new machinery throughout.

The Cyphers Incubator Company, Buffalo, whose plant was destroyed by fire recently, has purchased a new site and is having plans prepared for manufacturing buildings which it will erect at once. G. M. Curtis, president, has temporary offices at Lockwood Building, Buffalo.

The Buffalo Journal Protector Mfg. Company, Buffalo, has been incorporated with \$50,000 capital stock by Lester E. Marvin, William H. Armstrong and George C. Preston, 1587 Broadway. The company will manufacture devices used to protect axle journals in railway car trucks. Factory facilities are being arranged for.

The Otis Bed Mfg. Company, Buffalo, has been incorporated with a capital stock of \$50,000 to take over and enlarge the plant and business of the George A. Otis Company, 818 Main street, manufacturer of brass and iron beds, etc. The directors of the reorganized company are Harvey A. Chadwick, president; John Meyer, N. Orsini de Bock and David Ruslander.

The Niagara Device Company, Buffalo, has been incorporated with a capital stock of \$100,000 to manufacture railway appliances and devices. Arrangements for a factory are being made. The directors are Edward D. Matteson, George A. Cotton and George R. Volkmar. George M. Stowe, Jr., 527 Ellicott Square Building, is to be general manager.

The Continental Motor Corporation, 1044 Ellicott Square Building, Buffalo, has filed incorporation papers with \$100,000 capital stock, and will engage in the manufacture of automobiles, motor trucks and motor parts and accessories. A factory has been leased and will be equipped at once. The directors are Gordon F. Matthews, Frank V. Whyland, Allen E. Choate, Walter Schmieding and Reverdy L. Hurd.

The Ontario Power Company, Fidelity Building, Buffalo, Francis V. Greene, president, will build a hydroelectric plant on the Salmon River at Pulaski, N. Y., to cost \$1,500,000. The general contract for the work has been let to the John F. Stevens Company, 55 Wall street, New York City, and comprises a dam 1000 ft. in length and a power house 200 x 250 ft., two stories.

The Sims Company, Erie, Pa., designer and manufacturer of steam specialties, has purchased a tract of four acres on which it will erect a building 100 x 200 ft., of brick and steel construction, with concrete foundations to be purchased, consisting of necessary machines for the construction of steel tanks, which line of work dates, to be completed by March 1. New equipment the company expects to add to its present output.

New England

BOSTON, MASS., September 16, 1912.

The Boston & Maine Railroad has sent out two short lists of machinery for its shops at East Somerville and Worcester, and the promise is that the big list for the new Billerica locomotive and car repair shops will be issued inside of two months. The General Electric Company is in the market for machine tools for its Schenectady and Pittsfield works. Business is very good with the machinery dealers, and they are confident of a continued improvement. The New England machine tool builders are prospering, the average experience being a consistent increase of orders and of inquiries which indicate a growing business.

The tool steel trade is an excellent barometer of the business in the machine shops. The demand is strong, fully up to the normal, and is expected to increase. The force of business habit is well illustrated in the buying. Houses which formerly purchased in considerable lots are still pursuing hand to mouth methods. Repeat orders for small lots are received with increasing frequency. The dealers realize, however, that this will soon be done away with, as buyers return to the more business-like way of placing orders for materials and supplies.

The Eco Mfg. Company, manufacturer of piston rings, has removed its business from Worcester to Boston, with main office at 53 State street and factory on A street, South Boston.

The new building of the Bridgeport Brass Company, Bridgeport, Conn., is an enlargement of the present tube building and will be 50 x 360 ft. and one story, with an ell 20 x 20 ft. The company states that the equipment will be largely special, and provision for its purchase has been made.

The Union Hardware Company, Torrington, Conn., will build an addition which will be an enlargement of the plating department.

The Cameron Mfg. Company, Beverly, Mass., has been incorporated with a Massachusetts charter to take over the business of the Cameron Car Company of the same town, manufacturer of automobiles. The incorporators are Everett S. Cameron, H. P. Cameron and Albion B. Emerson. The main office, together with the engine and transmission departments, is located at Beverly, while the manufacture of car bodies and sheet metal parts is carried on at Attica, Ohio, together with the assembling of cars for the Western trade. The company has purchased the machinery and other equipment of the Pickard Bros. Motor Car Company, Brockton, Mass. The management states that the company expects to put out 1000 cars in 1913, manufacturing them complete. It will be in the market for raw materials.

Additions to general manufacturing facilities of New England include the following: Newton Paper Company, Holyoke, Mass., power house 50 x 100 ft., to contain engine room, condenser room and boiler room, and to have a 125-ft. stack; Birdseye-Somers Company, Bridgeport, Conn., power house, 42 x 43 ft., of concrete, fireproof construction; R. I. & D. Gough & Sons, Pawtucket, R. I., power plant; Sheffield Scientific School of Yale University, New Haven, Conn., electrical laboratory building, 75 x 100 ft., three stories, of brick and steel, to cost \$75,000; Herman & Lichter, Monson, Mass., rebuilding and enlarging factory recently damaged by fire; Westfield Structural Company, Westfield, Mass., plant for a new company organized by W. J.

Marshall, Holyoke, Mass.; Watson-Frye Company, Bath, Me., foundry building, 40 x 50 ft., of concrete block.

The New Departure Mfg. Company, Bristol, Conn., has awarded the contract for its new building, which will be 62 x 215 ft., three stories, of fireproof, skeleton steel construction.

The latest development of the effort to make the Connecticut River navigable to Springfield and Holyoke, Mass., is an offer by the Stone & Webster interests of Boston for the stock of the company which controls the water rights above Windsor Locks, Conn. It is understood that Stone & Webster are willing to spend \$4,000,000 on the project, developing the power of the river at this point and at the same time creating channels with locks which would permit the passage of light draft vessels to the important cities 25 miles and more to the northward. The negotiations have not been concluded.

The New England territory is deeply interested in the receivership of the United States Motor Company, for its works in this territory have been important buyers of machinery and materials. The company operates the Columbia Motor Car Company, Hartford, Conn.; Alden Sampson Mfg. Company, Pittsfield, Mass.; Maxwell-Briscoe Company in Rhode Island, and the Providence Engineering Works, Providence, R. I. The utmost confidence exists that reorganization will preserve the existence of these plants.

The new building of the Electric Cable Company, Bridgeport, Conn., construction of which is about to begin, will be used for lead presses as well as for braiding, stranding and testing rubber covered wire. It will be a large structure, of brick, mill construction.

The Athol Machine Company, Athol, Mass., manufacturer of mechanics' tools, has let the contract for its new shop building, which will be 60 x 142 ft., three stories. It will be of reinforced concrete and will cost about \$50,000.

The new factory of the Edward Miller Company, Meriden, Conn., will replace an old building now standing and will be 35 x 100 ft., five stories. The company states that no new equipment will be required excepting as provided for.

Philadelphia

PHILADELPHIA, PA., September 17, 1912.

A moderate volume of new business has been closed in the week by both machinery merchants and machine tool builders. Trade has a somewhat better appearance. Sellers look forward to a more active buying movement in the near future, as users of machinery and tools are steadily becoming better engaged. Railroad buying of machine tool equipment continues at a low point in this market. An occasional purchase of an odd tool represents the volume of business on the part of the local railroads. Sales generally have been confined to small equipment, usually single tools or small groups. Power equipment negotiations do not develop into business very rapidly although a better volume of buying is in sight. Electrical power equipment is in better demand than is that of other classes. Second hand machinery and tools continue in moderate demand. In the foundry trade conditions continue to improve, with steel casting plants leading in point of activity.

Charles W. Young & Co. are taking proposals for the construction of a three-story warehouse and office building 35 x 163 ft. on Twenty-sixth street south of Thompson street. This concern proposes to replace its present steam power plant by an electric plant and will also install an additional 150-hp. boiler.

The Tubular Products & Steel Works, Inc., Philadelphia, has been incorporated under the Delaware laws, with a capital stock of \$300,000. It proposes to engage in the manufacture of iron and steel and pipes and tubes of iron, brass and steel. The incorporators named are Edwin E. Natcher, Charles G. Guyer and S. E. Becker of Wilmington, Del. Details as to the plans of the new corporation are not available.

Tunick Bros. & Kaplan, box manufacturers, have purchased the property at 716-728 South Eleventh street, formerly occupied by the Hutchinson Baking Company, and will alter it for the manufacture of paper boxes. The building is 90 x 126 ft., three stories. It has not been fully decided whether a steam or electric power plant will be installed. A considerable portion of additional box making machinery will, however, be required.

The plant of the Lebanon Chain Works Company has, it is stated, been purchased by a syndicate in which Thomas Evans of Lebanon, Pa., is prominently identified. The plant suspended operation several years ago,

owing to financial difficulties. It is stated that the new owners will enlarge the plant and resume operations at an early date.

Charles Balderston is preparing plans for a two-story brick and reinforced concrete garage 83 x 114 ft., to be located at Twentieth street and Indiana avenue for the Friehofer Baking Company.

It is reported that a company has been formed which will lease or purchase the repair shop of the Lehigh Valley Railroad Company at Weatherby, Pa., operations of which have recently been discontinued, and operate it in the production of malleable castings and boilers and in the fabrication of structural steel. Among those identified with the new industry are Raymond Thorpe, John E. Rosenstock, R. O. Sendel, F. A. Kunkle, E. F. Warner, P. E. Faust and Lewis C. Nuss. Plans for the organization of the new company are now under way.

The David Berge Distilling Company has let the contract for the erection of a two-story distillery 40 x 60 ft., with wings 60 x 85 ft. and 16 x 63 ft., to be located at the corner of Swanson and Tasker streets. The machinery required will be confined to special equipment for distillery purposes.

Plans are under way for the building of a fire brick plant at Harwood, Md., for the Maryland Fire Brick Company, which will be incorporated with a capital stock of \$300,000 under the Delaware laws. The officers of the company will be as follows: S. B. Kanowitz, president and general manager; R. Kanowitz, vice-president, and W. K. Kanowitz, secretary and treasurer. G. R. Gahrhard will be general superintendent. The company proposes to manufacture fire clay products for all classes of furnaces and engage in the general engineering end of the business in connection with power plants, industrial furnaces and gas works. A tract of 75 acres has been purchased, on a portion of which a new plant is to be built.

Chicago

CHICAGO, ILL., September 71, 1912.

A general slackening of buying interest was noticeable in the past week, attributed by some to the extreme heat. A marked absence of country buyers affected floor sales to a considerable extent. Orders that were placed were confined to scattered propositions of moderate size. Of the large inquiries in the market the Chicago & Alton requirements have been awarded to Joseph T. Ryerson & Son, the others remaining unplaced. All bids on the list of the Pennsylvania Lines West have been received and the award is expected this week. The equipment is to be installed at Fort Wayne. The purchase of the equipment listed by the Busch-Sulzer Bros.-Diesel Engine Company, St. Louis, is expected to be completed within the next fortnight. F. Hennibohle, who is building a new machine shop at South Chicago, bought several new machines, turning in some used machinery in exchange.

The Central Scientific Company, Chicago, has purchased a site on Washington boulevard on which it will erect a four-story factory building.

The Illinois Vinegar Company, Chicago, is erecting a two-story factory at 2632 Nineteenth street, at a cost of \$35,000.

The Chicago White Lead & Oil Company, Chicago, has purchased a plot, 80 x 257 ft., on West Fifteenth street, on which it proposes to erect a new plant for the manufacture of white lead.

Shower Bros., Bloomington, Ill., furniture manufacturers, will double the capacity of their plant by 200,000 ft. of additional floor space. The addition is estimated to cost \$210,000.

The Illinois Cabinet Company, Rockford, Ill., has increased its capital from \$100,000 to \$200,000 for the purpose of increasing its plant and equipment.

The Burson-Ziock-Brown Knitting Company, Rockford, Ill., has let the contract for a six-story plant on South Wayman and Green streets. Construction will be of reinforced concrete.

The Aurora Automatic Machine Company, Aurora, Ill., is about to award contracts for additional manufacturing buildings, the larger to be 137 x 150 ft.

H. Schmidt & Son, Milwaukee, Wis., will erect an \$8,000 factory at Thirty-fifth street and St. Paul avenue.

John G. Patterson, Milwaukee, is planning the erection of a two-story factory on Third street and Christine lane. The building will be 60 x 130 ft., of brick and concrete.

The National Brake & Electric Company, Milwaukee, has taken out a permit for the erection of a \$100,000 foundry on Cambridge avenue. The building will be 241 x 239 ft., one story.

Gordon & Ferguson, St. Paul, Minn., have purchased a tract of land in that city on which they propose to erect a \$450,000 building for the manufacture of gloves.

The Griffin Wheel Works, St. Paul, Minn., is erecting a two-story brick addition to its factory at Stillwell and Phalen avenues, at a cost of \$50,000.

Detroit

DETROIT, MICH., September 17, 1912.

Machine tool merchants report a good volume of business placed in the past week in single tools and groups of two to five tools. Inquiries received indicate that business is still on the upward trend and a good volume of orders for the remainder of the month is looked for. The second-hand machinery market is rather dull and the demand for boilers and engines is also rather light. The foundry trade continues satisfactory and the majority of plants are actively engaged.

General industrial conditions in Detroit are in a healthy condition and in spite of the financial difficulties of the King Motor Car Company and the United States Motor Company, which owns three factories in the city, the motor car industry generally is on a sound basis and its prosperity in no way impaired. The copper and brass manufacturing interests are also actively engaged, with trade steadily improving. Contractors all continue busy and building circles see no diminution of the active conditions which have prevailed the greater part of the year.

Trangott, Schmidt & Sons, Detroit, tanners, have begun the construction of an addition to their tannery, 62 x 187 ft., five stories, reinforced concrete construction.

The Ford Motor Company, Detroit, has acquired 50 acres of land adjacent to its branch plant at Walkerville, across the river from this city, with a view of permitting extensions to the plant. The company plans to greatly increase its production of cars both at its main and branch plants and considerable new machinery is being installed.

The Detroit Socket Company, Detroit, manufacturer of automobile parts, has filed notice of an increase of capital stock from \$40,000 to \$75,000.

The Pearl Machine Company, Detroit, has been incorporated with a capital stock of \$25,000 to carry on a general machine shop and manufacturing business. The incorporators are Harvey Elliott, Stewart J. Elliott and Duncan White.

The General Castings Company, Detroit, has been incorporated with \$2,000 capital stock to carry on a foundry business. F. Walter Guibert is the principal stockholder.

The Detroit File Renewing Company, Detroit, has been incorporated with \$10,000 capital stock to manufacture files and other tools. Harry Neff is president, Rene D'Hondt vice-president and James Ramsey secretary and treasurer.

John B. Cole and W. E. Stipe, Chelsea, Mich., are negotiating for a gas franchise at Tecumseh, Mich. They propose to erect a large gas plant.

The Piston Ring Company, Muskegon, Mich., has outgrown its present factory quarters and has increased its capital stock to \$13,000 to provide for a new factory building, 40 x 125 ft., work on which will begin at once.

On the application of stockholders William F. Selleck has been named as receiver of the Portland Mfg. Company, Portland, Mich., manufacturer of motor washing machines. Plans for a reorganization of the company on a larger scale are already under way.

The Hand Corporation, Grand Rapids, Mich., has been incorporated with \$30,000 capital stock for the purpose of manufacturing and dealing in automobile accessories. The incorporators are George C. Whitworth, Louis A. Cornelius and George H. Hand.

The Baker Drop Forge Company, Jackson, Mich., has increased its capital stock from \$65,000 to \$130,000.

The Hayes Wheel Company, Jackson, Mich., manufacturer of automobile wheels, has increased its capital stock from \$100,000 to \$300,000.

The Wilber-Morse Concrete Company, Adrian, Mich., has been organized with \$15,000 capital stock to manufacture concrete products.

The Michigan & Chicago Railway Company has been authorized to incorporate by the Michigan Railroad Commission with \$3,000,000 capital stock. The company proposes to build an electric railroad between Grand Rapids and Kalamazoo, Mich., and has already purchased a tract of 80 acres in the former city for terminals, repair shops, etc. H. H. Crowell, Grand Rapids, is president and T. Fletcher, Kalamazoo, secretary-treasurer.

The Glengarry Upholstering Company, Cadillac, Mich., has increased its capital stock from \$20,000 to \$40,000 to provide for the erection of an addition to its plant.

The Pioneer Gas & Oil Company, Saginaw, Mich., has been organized to develop oil lands in that vicinity and will at once install machinery and erect oil tanks. George Holcomb is president and Harry Erd secretary of the company.

The Central Michigan Produce Company, Alma, Mich., manufacturer of dairy products, will spend \$20,000 for new equipment to its plant.

The Michigan Central Railroad has changed the plans of its construction work going on at Bay City, Mich., so as to increase the capacity of the new roundhouse from 30 to 40 stalls and the capacity of the machine shops about one-third.

Cleveland

CLEVELAND, OHIO, September 17, 1912.

Business in machinery lines continues to come out in satisfactory volume. The buying, however, is largely in single tools. An Ohio automobile builder has an inquiry out for about \$40,000 worth of equipment, most of which is for small-sized tools. This is the only new inquiry of any size. Both the domestic and foreign demand for automatic screw machines is very active, being better than it has been at any time in the past two or three years. The demand for forging machinery is good, a local builder having taken considerable business recently from railroads and car companies. In handling equipment there is little inquiry for large installations, but a good volume of orders is coming out for cranes, locomotive cranes and small hoists. Second-hand machinery is moving freely and more is being offered to dealers than for some time. Supply dealers are doing a heavy volume of business and are having difficulty in keeping their stocks replenished. The foundry trade is in a very satisfactory condition.

The Allyn-Ryan Foundry Company, Cleveland, which was recently incorporated with a capital stock of \$100,000, will build a plant on a six-acre site on Aetna road and the Belt Line Railroad. Contracts for a building 112 x 280 ft. have been placed by the Forest City Engineering Company, Cleveland, which prepared the plans. It will contain a foundry, core room, chipping and grinding room, sand blast room, machine shop and offices and will be a modern structure in every particular. It will have a steel superstructure of the monitor roof construction type, having 5600 sq. ft. of skylight in the roof. A 10-ton crane will be installed in the center bay and other smaller cranes will serve the side bays. The building will be heated by a hot air blast system and steam and be electrically lighted. The plant has been designed especially for casting automobile parts. It is the intention to have it ready for operation by January 1. The company will be under the management of D. J. Ryan, who has been superintendent of the Interstate Foundry Company, Cleveland.

The Concrete Steel Company, Youngstown, Ohio, has secured an option on a site on which it plans to erect a new plant, 80 x 375 ft., of steel, stone and concrete construction.

The Strong, Carlisle & Hammond Company, Cleveland, machinery dealer, will shortly greatly enlarge its present storeroom facilities. This company has leased a four-story and basement building on West Third street which it will connect to its present rooms on Frankfort avenue by the erection of a building adjoining the two structures. Additional floor space amounting to 40,000 sq. ft. will be provided. The addition will also permit the company to have an entrance on West Third street. The new space provided will be used for the supply department.

The Erie Railroad has placed a contract for the erection of a new machine shop, 100 x 200 ft., and a boiler shop, 50 x 100 ft., at Marion, Ohio.

The Perfection Mortise Machine Company, Columbus, Ohio, recently incorporated, has been organized to take over patents and property of the Perfection Mfg. Company and will manufacture a door lock mortising machine.

W. J. Springborn, director of public service, Cleveland, will receive bids October 10 for three 5000 kw. steam turbo generators, complete, for the new municipal electric light plant. On September 25 bids will be received for arc lamps and other equipment for the same plant.

Cincinnati

CINCINNATI, OHIO, September 17, 1912.

Machine tool builders continue giving out optimistic reports. Domestic orders are now coming in from all parts of the country. The railroads are also doing considerable buying, and there are several lists before the trade yet to be bought on. Among them is quite an extensive one from the Pennsylvania Lines West, calling for a variety of tools. Boiler and tank makers are busier, and there is an excellent demand in this territory for small internal combustion engines. There is no change in the foundry situation, or with second-hand machinery dealers, although the latter report a slight improvement in the South.

The Cincinnati Milling Machine Company, Oakley, Ohio, has received from the American Museum of Safety, New York, notice of the award of a commemorative medal by the International Exposition of Hygiene, held at Dresden, Germany, last year, for its exhibit in accident prevention, industrial hygiene and mutuality. The notification letter continues: "Furthermore, we wish to advise you of an additional honor for your exhibit, in that it now forms a part of the permanent collection in the great Berlin Museum of Safety. This is particularly gratifying to the American Museum of Safety, inasmuch as it is the first time that any non-German exhibit has been installed at the Berlin Museum."

The Chesapeake & Ohio Railway Company, B. T. Jellison, purchasing agent, Richmond, Va., is inquiring in this market for prices on the following list of machinery and tools:

One No. 406 S. A. Wood special fast feed planer and matcher; size 19 x 6-in., to be driven with a three-phase, 60-cycle, 220-volt a.c., motor bolted direct to a 12 x 16-in. pulley, to turn 950 rev. per min. The machine to be equipped with six knife solid round cylinders and to work stock up to 19 x 6-in.

One Lowe patent staybolt breaker, of improved type, with automatic pull back cylinder for breaking down staybolts in repairs to locomotive boilers.

One Whitelaw staybolt nipper, to cut off staybolts up to 1 1/4 in. in diameter.

One R. E. Reed patent 16-in. engine lathe; to be furnished with elevated rest and compound head.

One belt-driven Bullard vertical boring and turning lathe, with a four-jaw independent chuck built in table.

One motor driven 90-in. driving wheel lathe, complete. Motor to operate on a 220-volt alternating-current circuit.

One belt-driven circuit punching machine, for punching holes 1 1/2 in. in diameter through 1-in. steel plate. Machine to have 20-in. depth of throat.

One belt-driven Lassiter, 6-spindle vertical staybolt threading and reducing machine, complete with all attachments for threading, turning and reducing staybolts and crown bolts.

Catalogue reference and manufacturer's names are only given to show the class of machine desired.

Local machine tool and machinery manufacturers are very much interested in the following list just issued by the Western Pacific Railway Company, W. T. Jacobs, purchasing agent, Mills Building, San Francisco, Cal.:

- One 42-in. x 22-ft. triple geared engine lathe, motor driven.
- Two 28-in. x 14-ft. engine lathes, motor driven.
- One 3-in. Acme single bolt cutter, or equivalent.
- Three 24-in. heavy crank shapers, with 5-hp. motors.
- Three 42-in. drill presses, with sliding head.
- Two Watson-Stillman hydraulic bushing presses, 35 tons capacity.
- Two 20-in. x 12-ft. engine lathes, with 5-hp. motors.
- One No. 4 O. & C. shop hack saw.
- One 48 x 48-in. x 30-ft. planer, with two heads on cross rail.
- One 18-in. slotter, with 7 1/2-hp. motor.
- One 14-in. friction drill, capacity up to 3/4-in. holes.
- Two 60-in. radial drilling machines, with 5-hp. motors.
- One 90-in. boring and turning mill, with one 10-hp. and one 2 1/2-hp. motor.
- One crank placer, 30 x 30 in. x 6 ft., with 5-hp. motor.
- One Cincinnati No. 3 universal milling machine, or equivalent, with 7 1/2-hp. motor.
- One 16-in. x 8-ft. tool room lathe, belt driven.
- One 18-in. x 12-ft. engine lathe, with 5-hp. motor.
- Two 2-in. Jones & Lamson, or equivalent, turret lathes.
- One 18-in. brass lathe, with attachments, belt driven.
- One 30-in. Underwood portable valve facing machine, or equivalent.
- One Pratt & Whitney, or equivalent, 4-in. centering machine.
- One Hilles & Jones No. 5 double punch and shear, or equivalent, with 25-hp. motor.
- Two large forges.
- One large forge for flanging.
- One flange, or horizontal punch, with 7 1/2-hp. motor.
- One pressure blower, with 10-hp. motor.
- One five-spindle railway boring machine, with 15-hp. motor.
- One Sturtevant No. 60, or equivalent, single exhaustor, with 50-hp. motor.
- One 42-in. steel tire car wheel lathe, with 35-hp. motor.
- Two 125-hp. Scotch marine boilers.
- Two underwriter fire pumps, 500 gal. per min. capacity.
- One belt-driven air compressor, 1050 cu. ft. per min. capacity, with 200-hp. motor.
- Three transformers, 50 kw., 1100/110-2200/220.
- One 3300-lb. single-frame steam hammer with anvil and six dies.
- One Bradley 200-in. helve hammer, with 5-hp. motor.
- Twelve 200-lb. anvils.
- One No. 9 Buffalo steel pressure blower, with 20-hp. motor.
- One Williams & White bulldozer, or equivalent, with 7 1/2-hp. motor.

The above machines are wanted for delivery at the company's Jeffrey shops.

The annual outing of the Cincinnati Branch, National Metal Trades Association, held at the Laughery Island Club, September 14, was attended by over 50 members. Alfred Marshall, Marshall & Huschart Machinery Company, Chicago, and Percy A. Ware, central Western manager of *The Iron Age*, were out of town guests entertained by the association. Secretary William S. Dickson and John W. Neal arranged the entertainment programme.

The Lunkenheimer Company, Cincinnati, manufacturer of valves, fittings and other engineering specialties, is having plans prepared by B. L. Baldwin & Co., Cincinnati, and the Hooper-Falkenau Engineering Company, New York, for an extensive foundry addition to its plant in West Fairmont. The new building will be of brick, concrete and steel construction, three stories, and will contain about 75,000 sq. ft. of floor space. It will be used for the production of gray iron, malleable and steel castings. The equipment shown in plans includes in part a modern sand conveying system, four 5-ton electric traveling cranes, eight 1-ton electric cranes and a number of hand jib cranes, two 80-ft. cupolas, eight puddling furnaces, core ovens, molding machines, etc. The company expects to have this foundry in full operation by the beginning of the spring season.

Heating boilers and other equipment will be required for a large school building to be erected at Tiffin, Ohio. Architect E. H. Dornette, Cincinnati, has the plans in charge.

Samuel Hannaford & Sons, Cincinnati, are now ready to receive bids on boilers and other heating equipment that will be required in the Galloway Memorial Hospital, to be erected at Nashville, Tenn. The estimated cost of the hospital is over \$500,000.

The Central Automobile Company, Newport, Ky., Walter P. Dickerson, general manager, is equipping an automobile repair shop, for which some small machine tools will be required.

The municipality of Erlanger, Ky., is considering the building of an electric lighting plant. The Town Council expects to act favorably on the proposition within the next few days.

The M. Marcus Building Company, Cincinnati, has been awarded contract for the large trunk factory to be erected at Norwood, Ohio, for the Mendel-Drucker Company, whose plans were recently mentioned.

Gustav W. Drach, architect, Cincinnati, has completed plans for the two-story factory building to be erected on Spring Grove avenue for the National Machine Tool Company, recently mentioned.

The Middletown Buggy Company, Middletown, Ohio, has changed its name to the Crescent Motor Truck Company, and it is rumored some extensions are contemplated at an early date.

The Youngstown Sheet & Tube Company recently awarded contracts for five Chapman rotary gas producers to the Chapman Engineering Company, Mount Vernon, Ohio. This contract is significant in that the first installation of this type of producer was made at this plant about two years ago.

Indianapolis

INDIANAPOLIS, IND., September 17, 1912.

The Indiana Free Employment Bureau, with headquarters in this city, states that there is greater demand for labor than at any time for three years. The chief calls come from factories, contractors, steel works and railroads. Good wages, steady employment, transportation and low house rents are put forward as inducements, but the demand cannot be filled.

New factory construction has been halted in the Calumet district, including Hammond, Gary, East Chicago and Indiana Harbor, for lack of mechanics and laborers. It is said that 10,000 men could get employment in the district. Ten new manufacturing plants are in course of construction.

The Showalter Mfg. Company, Indianapolis, has been incorporated with \$10,000 capital stock, to manufacture automobile bodies, etc. The directors are H. G. and E. W. Showalter and William Small.

The Consolidated Construction Company, Indianapolis, has been incorporated to do railroad and general building. The directors include Albert Sahm and L. B. Jones.

The Martin Tractor Company, Indianapolis, has been incorporated with \$350,000 capital stock, to manufacture tractors. The directors are C. H. Martin, H. R. Richards and E. D. Moore.

The American Cement & Tile Mfg. Company, New-castle, Ind., has been incorporated with \$100,000 capi-

tal stock, \$10,000 of it in Indiana, to manufacture tile, etc. The directors are I. H. Freund, J. Freund and M. Guntown.

The Mooresville Utilities Company, Mooresville, Ind., has been incorporated with \$75,000 capital stock, to operate a light and power plant. The directors are E. E. Gates, Indianapolis; J. A. Ross, Indianapolis, and J. S. Powell, of Mooresville. The company will operate the plant of the Mooresville Water, Light, Heat & Power Company, which has just been sold at receiver's sale to W. C. Stevens, Chicago, chairman of the bondholders' committee, for \$60,000, the sale being practically a foreclosure of the mortgage on the property.

James McLaren & Sons, Bedford, Ind., have been incorporated with \$75,000 capital stock, to quarry and manufacture building stone. The directors are James R. and A. E. McLaren and G. K. Beddoe.

The Keyless Lock Company, Indianapolis, is planning the erection of a two-story fireproof factory building to occupy a site of 1½ acres at Sheldon street and Union Railway at a cost of \$75,000. Oil furnaces will be used for melting brass and aluminum, and large gas ovens will be installed. The company will manufacture brass and aluminum motor car castings.

The Big Four Railroad has awarded the contract for the construction of a round house at Elkhart, Ind., to the H. A. Peters Company, 19 South LaSalle street, Chicago.

The H. J. Martin Forging Company, Indianapolis, is about to build a new shop, 60 x 100 ft., one story. Plans are not yet completed.

The Central South

LOUISVILLE, KY., September 17, 1912.

Business in the past week felt the effects of the holiday spirit engendered by the State Fair, and purely local trade suffered accordingly. The outlook is considered excellent, however, and the temporary lull was not regarded as significant. A good many inquiries are being received for machinery, but there is complaint on the part of manufacturers of excessively low prices being quoted. In view of the fact that there seems to be plenty of business afloat, no good reason for offering equipment at prices which do not admit of a fair profit is evident.

The Red Chief Mfg. Company, Louisville, is considering the enlargement of its plant, and new machinery will be installed as soon as additional space can be provided for. The company makes cider presses and hand-mills.

The Edwards Motor Car Company, Louisville, which has been in process of organization for some time past, will have a capital stock of \$2,000,000, it is announced. C. G. Stoddard and H. J. Edwards, New York City, are the principal parties interested, and they have arranged to take over the motor truck plant of the Longest Bros. Company, Louisville, which will be enlarged. A new factory to make passenger cars will be established in or near New York, it is stated. Those connected with the project say that it will be in definite form about October 1.

The Jefferson Woodworking Company, Thirtieth street and Garland avenue, Louisville, has begun the erection of an addition to its plant. It makes table slides and rims. C. C. Mercke is the head of the concern, which will spend \$8,000 for machinery.

Joseph & Joseph, Louisville architects, have completed plans and specifications for the new National Theater to be built in Louisville at an estimated cost of \$200,000, and will call for bids in the near future. It will be equipped with elevators, a large ventilating and refrigerating plant and possibly power equipment, though decision on the latter item has not yet been made. George G. Epstean, Detroit, Mich., is one of those interested.

The plant of the Wilmore Ice, Electric & Bottling Works, Wilmore, Ky., was recently destroyed by fire, the loss being in the neighborhood of \$15,000. The owners are planning to rebuild.

Plans for a municipal electric light plant are being considered at Mt. Vernon, Ky. Address the mayor.

The Kentucky Traction & Terminal Company, Lexington, Ky., is considering the establishment of electric light service at Georgetown, Ky. Additions to its substation equipment at Georgetown will be required.

G. E. Rex, Island, Ky., has commissioned L. R. Veatch, Louisville, to design and build a flour mill with a capacity of 50 bbl. a day. Mr. Veatch is in charge

of machinery purchases with the exception of power equipment, which will be ordered by the owner.

The flour mill of C. B. Carden, Fordsville, Ky., was burned September 12. The loss was about \$10,000. As soon as the insurance loss is settled plans for rebuilding will be considered.

The Modes Glass Works, Frankfort, Ky., will reorganize on larger lines, it is reported, and will make extensive additions to its plant.

A waterworks franchise will be sold by the city of Campbellsville, Ky., September 23. George Gowdy is the prospective purchaser, having organized a company which will construct a plant.

The Board of Water Works Trustees, Evansville, Ind., is to make improvements costing about \$50,000 during the next fiscal year. A new boiler will be installed at the pumping station and a considerable amount of new mains laid down. Henry Heilman is secretary of the board.

The Knoxville Veneer Company, Knoxville, Tenn., has been incorporated with \$25,000 capital stock to continue an established business. Rotary machines for the manufacture of veneers will be installed. P. B. Raymond is general manager.

The machine shops of the Illinois Central Railroad at Jackson, Tenn., suffered \$40,000 damage by fire September 7. The company has announced that it will rebuild at once.

The Walker Medicated Soap Company, Nashville, Tenn., will establish a factory. The Industrial Bureau of Nashville has the details of the project.

C. E. James, Chattanooga, Tenn., has plans for a hosiery mill to be erected at a cost of \$100,000. Samuel McCracken will be in active charge of the project.

The Ashworth-Crosshead Remetaling Company, Chattanooga, Tenn., has been formed with \$25,000 capital stock by R. M. McNabb, Albert Ashworth and T. E. McLean.

Paul Felix has been appointed superintendent of the Modern Tiling & Mfg. Company, Knoxville, Tenn., and will be in charge of the purchases of machinery for the plant. A. S. J. Davis is president of the company, which will manufacture floor tiling, wainscoting and artificial stone.

Birmingham

BIRMINGHAM, ALA., September 16, 1912.

Machinery dealers and others report a strong market. The fact that the pig iron and steel producing plants are active—a consequence being a steady operation of ore and coal mines, limestone quarries and other works—brings about a general good feeling among the dealers in boilers, pumps and engines. There is also a strong activity among the lumber manufacturers, and from that source comes a report that there will be a need for much machinery. The coal production is to be improved, the only obstacle in the way being the shortage of railroad cars with which to handle the product. Of course, the mine operators need much machinery in the course of time.

Machinery is being received for the new cotton mills of the Avondale Cotton Mills Company, at Sylacauga, Ala. B. B. Comer, Birmingham, is president. He was formerly governor of Alabama.

The Royster Guano Company, Montgomery, Ala., is erecting an addition to its main building. The daily output of the plant will be increased to 700 tons. The improvements are estimated to cost \$25,000.

The Decatur Cornice & Roofing Company, Decatur, Ala., has begun the construction of an addition to its foundry. It will be 40 x 80 ft. It is also arranging to purchase new equipment for its machine shop.

The Mobile Electric Company, Mobile, Ala., will spend \$85,000 in additions to its mechanical equipment. The installation of a 3000-kw. turbine generator is the principal part of the work.

The Florida Freezer & Fertilizer Company will establish storage plants at Stuart and Gosling, Fla. R. A. Hammond, White City, Fla., is president of the company.

Marshallville, Ga., is preparing to install waterworks and electric lighting systems, at cost of \$20,000. The J. B. McCrary Company, of Atlanta, prepared the plans.

Camilla, Ga., will put in waterworks system, \$10,000 having been appropriated for the purpose.

Cordele, Ga., may install an electric lighting plant. W. D. Dorris is mayor.

The Jefferson Fertilizer Company, near Bessemer, is figuring on an enlargement of the plant which will necessitate the installation of additional machinery.

St. Louis

ST. LOUIS, Mo., September 16, 1912.

A satisfactory volume of business continues in the machine tool market, the orders running to small aggregates individually, but increasingly large in the final total. The inquiry is, as on previous reports, still on single tools and small lists, none of material size appearing in this market. However, a continuance of the present business will be very satisfactory to the dealers and from present indications a steady increase in volume is to be expected. Collections very generally are good.

The Knollman Paper Company, St. Louis, has plans for the construction of an eight-story and basement warehouse and converting plant building, with some machinery requirements.

Fire in the plant of the John C. Kupferle Foundry Company September 7 caused \$50,000 damage to the plant and equipment. Both will be replaced at once.

The Douglas-Savage Lumber Company, Amity, Mo., has been incorporated with \$22,000 capital stock and will equip a mill at once. The incorporators are Z. H. Savage, J. C. Douglas and others.

The Heimsch Automobile Company, with John N. Bleck as president, has obtained a site upon which it will construct and equip a large repair shop with incidental garaging facilities in St. Louis.

The Yellow Pup Mining Company, Kansas City, Mo., with \$48,000 capital stock, has been incorporated by R. O. Lawson, O. W. Sparks, W. F. and William Scott and others to develop and equip mining property owned by them in the lead and zinc belt.

The Mammoth Milling Company, Kansas City, Mo., with W. J. McGraw, W. B. McMechen, S. H. Criswell and others, has been incorporated with \$58,000 capital and will engage in the building and equipment of elevators and flour mills.

The Lewis Automobile Company, St. Louis, with \$26,000 capital stock, has been organized by J. D. P. Lewis and others to equip a repair shop and garage and otherwise engage in the automobile business.

The St. Louis Vitrolite Company, St. Louis, with \$50,000 capital stock, has been incorporated by C. H. Heidbrink, A. C. Fitze and V. M. and C. E. Heidbrink to equip a plant and engage in the manufacture of artificial stone.

The plant of the John C. Kupferle Foundry Company, St. Louis, was damaged by fire on September 8, with a loss on machinery installed of about \$40,000.

Dr. Thomas M. Sayman, manufacturer of soaps, St. Louis, has let the contract for the erection of a fireproof factory building on Franklin avenue. The structure will be of re-enforced concrete and will cost about \$230,000. Albert B. Groves is the architect.

The Arkansas Packing Company, William Cargill directing, will immediately construct a large packing plant at Pine Bluff, Ark., with modern mechanical equipment.

The St. Louis Cordage Mills, a branch of the American Mfg. Company, have plans for the construction of an addition to the plant involving about \$85,000.

The Western Blowpipe & Sheet Metal Company, St. Louis, has acquired a new building, about doubling its space, and will increase its mechanical equipment accordingly.

The H. Rampendahl, Jr., Company, Metropolis, Ill., has been incorporated with \$50,000 capital stock by W. F. Rampendahl, L. Rampendahl, J. Rampendahl and H. Rampendahl to equip a plant for the manufacture of slack cooperage.

The Baker Rail Joint Company, Oklahoma City, Okla., has completed plans for the construction of a plant for the manufacture of a patented rail joint. It will include a forge and rollers. The capital stock is \$100,000 and W. F. Baker is president.

The Magdalen Oil Company, Bartlesville, Okla., with \$25,000 capital stock, has been incorporated by M. F. Stilwell, H. V. Porter and others to develop and equip oil property owned by them.

The Cherokee-Choctaw Mining Company, Heavener, Okla., with \$150,000 capital stock, has been organized by F. Colnon, of that city; W. H. Candler, of Sallisaw, Okla.; F. A. Parsons and S. W. Brewster, of Chanute, Kans., and will develop mining property owned by the stockholders.

A concentrating plant with 250 tons capacity daily will be built on property near Joplin, Mo., by W. O. Cragg. It will be electrically operated.

Plans are being prepared for the construction by J. W. Dennison & Co., West Helena, Ark., of a hardwood lumber mill with a daily capacity of 35,000 ft.

The Virginia-Carolina Naval Stores Company, organized by J. W. and Charles Williamson and W. S. Boone, have completed plans for the equipment at Columbia, Miss., of a plant for the recovery and distillation of turpentine.

The Packard Kansas City Company, a subsidiary of the Packard Automobile Manufacturing Company, will build a \$30,000 plant at Kansas City, Mo., for repair work, etc.

The Livingston Telephone Company, organized at Springfield, La., will construct a system to cover Livingston Parish and to extend to Ponchatoula. J. M. Ehlert and W. J. Settoon are the active principals.

Texas

AUSTIN, TEXAS, September 14, 1912.

The demand for irrigation pumping plants continues unusually heavy for this season. There is much being done in the way of improving existing municipal water works plants and other public utility properties. The cotton crop harvest is progressing rapidly, although much complaint is heard of a shortage of laborers. It is also seriously affecting all lines of building trades and the movement of railroad traffic.

The Franklin Water & Light Company is installing new machinery in its waterworks and electric light plants at Franklin.

The Consolidated Mutual Reservoir, Irrigation & Canal Company will begin the construction of the first unit of its large irrigation system near Grand Falls next month. The cost of the proposed improvement will be about \$400,000.

The El Paso Chemical & Fiber Company has been reorganized and its capital stock increased from \$50,000 to \$85,000. It will enlarge its plant at El Paso for the manufacture of chemicals and fiber goods.

G. L. Jones, of Temple, will install an electric light and power system at Rogers. The current will be brought from the plant of the Temple Power & Light Company at Temple, a distance of 14 miles.

The Duff-McNey Foundry & Machine Company has let the contract for an addition to its plant at Temple to E. L. Bolen. The new building will be equipped with new machinery.

The Consolidated Oil & Gas Company, Dallas, has been organized with a capital stock of \$50,000 for the purpose of operating in the Humble oil field. The incorporators are George E. Megert, Sidney A. Stemmons, J. W. Crotty, F. E. White and A. M. Vaughan, all of Dallas.

The organization of a company is being promoted at Ballinger for the purpose of building a dam across the Colorado River, 18 miles from Ballinger, and the construction of a large system of irrigation at a cost of approximately \$1,000,000. The proposed dam will form a large water storage reservoir which will provide an ample supply of water to run through dry seasons.

The Bells Gin Company, Bells, has been organized for the purpose of installing a cotton gin. The incorporators are H. Seay, of Bonham; E. H. Luby and W. Jackson, of Tom Bean.

It is announced by W. A. Webb, general manager of the Missouri, Kansas & Texas Railroad, that a water-treating plant will be installed at Waco at a cost of about \$75,000. A boiler washing outfit will also be installed. The work of erecting the car repair shops of the road in East Waco will soon be started.

Irving C. Harris, of the United States Reclamation Service, is in charge of the construction of an electric power transmission line which is to run from the hydroelectric plant at the Roosevelt dam to the mines of the Inspiration Copper Company and the Mima Copper Company at Mima, Ariz. This line will be 35 miles long and will supply 11,000 kw. The cost of the line will be more than \$500,000.

W. J. Patterson, of Pittsburgh, Pa., has been investigating the situation at Houston with a view of establishing a plant for the manufacture of glass.

The Greenville Compress Company, Dallas, has been organized with a capital stock of \$100,000. It plans to establish cotton compresses in a number of counties of that section. The incorporators are S. W. King, Jr., W. D. Felder and Marris E. Berney.

The Lockhart Oil & Gin Company has increased its capital stock from \$30,000 to \$50,000. It will make improvements to its cottonseed oil mill at Lockhart.

The Pecos Valley Gas & Electric Company has taken over the holdings of the Artesia Light & Power Company, at Artesia, N. M. The new company is preparing to install new engines and other equipment in its plant.

The City Council of Sweetwater has sold the issue of \$35,000 of sewer bonds which were recently voted by the taxpayers and the work of constructing a new sewer system will soon be started.

The City Council of Yoakum has disposed of \$32,000 of sewer bonds and the profits will be used for the construction of a sewer system.

The Comal Irrigation Company will construct a dam across the Dry Comal River and another across Cibola Creek in Medina County for the purpose of storing water to irrigate about 50,000 acres of land. Involved in the project is the construction of a large system of canals and ditches. Emil Locke, of San Antonio, is largely interested in the enterprise.

The Prest-o-Lite Company, Indianapolis, Ind., is preparing to install a large plant at Houston.

The City Council of Bishop has under consideration the matter of constructing a complete system of sewers at that place.

The Cotulla Power & Ice Company will establish an electric light plant at Cotulla.

The City Council of Cotulla has under consideration the installation of a waterworks plant and construction of a distributing system there. Doland A. Gouger is mayor.

The Floresville Ice & Power Company has completed the installing of a new ice plant at a cost of \$10,000 at Floresville.

The Schulenberg Ice & Light Company will install a large ice plant at Schulenberg. It recently purchased the electric light plant and has made important improvements to the property.

Green & Welhausen will construct a dam across the Guadalupe River, about 12 miles from Yoakum, for the purpose of storing water to operate a hydroelectric plant. From this plant power transmission lines will be constructed to Yoakum and other towns of that section. They also contemplate providing the town of Yoakum with a system of electric lights.

J. W. Fullerton, of Devine, will construct a system of irrigation on the tract of land that he owns near Asherton.

The Pacific Coast

PORTLAND, ORE., September 10, 1912.

In the machine tool market attention is concentrated on the large railroad lists that have come out recently. The Southern Pacific Railroad has approved plans for the construction of new machine shops at its plant in South Portland, at a total cost of about \$200,000, and will place orders on its list of tools very shortly. Buying on the part of local interests is gradually becoming more general, and conditions are favorable for moderate activity for the next three months.

The great activity in the lumber market is the principal feature in the general machinery business at present, and is reacting indirectly on the machine tool trade, as much of the special equipment used in mills and logging camps is of coast manufacture. Old mills are being remodeled and put in operation all along the coast, and the advance in log prices will doubtless encourage logging in places formerly too inaccessible. Activity in the coastwise lumber trade has also brought an unusual number of inquiries for new steamers, of both steel and wooden construction. The demand for contractors' equipment continues strong, as numerous road, railway and power development projects are in progress.

The report, at one time denied, that the Astoria Iron Works, Astoria, Ore., would establish a plant at Seattle, Wash., has been revived.

The Smith-Powers Logging Company, Marshfield, Ore., has just received 16 logging trucks from a Seattle firm, and is preparing to let contracts for 20 miles of new railroad to extend into the C. A. Smith timber land.

The Decarie Safety Boiler Company, R. Macleay, president, and F. L. Decarie, manager, has established a new shop on Upshur street, near Twentieth street, this city.

The Rainier Lumber & Shingle Company, Rainier, Ore., has made arrangements to enlarge its mill and install electric power.

The Silver Falls Lumber Company, this city, has let contracts for the construction of 25 miles of standard gauge logging road into the timber around Silverton, Ore.

The Reid Bros. Company has purchased a water-

front site for a boiler shop at Bellingham, Wash., and will put up a two-story corrugated iron building. The Corliss Gas Engine Company, Petaluma, Cal., has let contracts for an addition to its plant.

Eastern Canada

TORONTO, ONT., September 14, 1912.

The weather has been an unfavorable influence in trade. It has made the harvest late and has caused a considerable falling off in the returns. The lateness enables the United States growers to get the first chance at the market for new wheat and to bring down the price before the Canadian grain is ready to be offered for early delivery. This has caused some moderating of plans for expansion of manufacturing capacity, but has had no perceptible influence on current business. The demand for machinery and equipment continues to keep much ahead of the manufacturers. The outlook is also excellent.

The ratepayers of Aurora, Ont., carried municipal by-laws granting to the Collie-Cockerill Company, maker of office furniture, a loan of \$15,000 at 5 per cent. for ten years and a fixed assessment of \$6,000 for a like period.

The announcement is made of another large industry secured for Guelph, Ont., being the Canadian branch of one of the largest malleable iron companies in the United States. A charter has been secured, the authorized capital stock being \$250,000, and an immediate start will be made on the erection of buildings. It will manufacture all kinds of malleable and gray castings, and the output is expected to be at least 15 tons a day.

A group of Canadians, including Sir William C. VanHorne, Sir William Mackenzie, George F. Johnston, C. W. McLean and J. Wesley Allison, has, it is said, secured from the Steel Package Company, of New York, the latter's patents to manufacture steel barrels and commercial packages of all descriptions. A factory is expected to be erected near Montreal. The company is to be named the Canadian Steel Package Company.

The Asbestos & Asbestic Company, Asbestos, Que., is erecting a shop.

The Goodyear Rubber Company will make extensions to its plant at Bowmanville, Ont.

Samuel Anglin & Co., Kingston, Ont., will build a factory.

The Cook-Fitzgerald Shoe Company, London, Ont., will double the capacity of its plant.

The Railway Department of the Dominion Government will make an addition to its repair shop at Moncton, N. B.

The Canadian Cement Company will increase the capacity of its plant at Lakefield, Ont.

The Richards Mfg. Company, Campbellton, N. B., will build a lumber and shingle mill.

St. Mary's Wood Specialty Company, St. Mary's, Ont., will build a sawmill and install special machinery.

The Canadian Factory Company will build a factory at St. John, N. B.

The Harriston Furniture Company, Harriston, Ont., will put in a new sawing outfit.

The Ritz-Carlton Hotel Company will build an hotel in Montreal to cost \$1,500,000.

The Major Mfg. Company, Montreal, will put up a factory to cost \$45,000.

The Alexander Syndicate, Montreal, will erect an office building and warehouse there to cost \$1,000,000.

A. Sommer & Co. will put up an office and factory in Montreal to cost \$400,000.

The Oriental Textile Company will build a factory in Oshawa, Ont., to cost \$12,000.

T. S. Simms & Co., St. John, N. B., are building a brush and broom factory to cost \$200,000.

The Dominion Government has approved the plans for increasing the capacity of the Harbor Commission's elevator at Montreal by 1,500,000 bushels.

The St. Thomas Biscuit Company, St. Thomas, Ont., proposes to establish a factory there.

The Canadian Roll & Machine Company, Ltd., Hamilton, has been incorporated with a capital stock of \$500,000 by John L. Counsell, Alexander C. McFarlane and others.

The Canadian Consolidated Rubber Company, Berlin, Ont., is asking bids for machinery for the equipment of its plant now in process of erection. T. H. Rieder, manager.

The De Long Hook & Eye Company of Canada, Ltd., St. Marys, Ont., has been incorporated and will

build a plant for the manufacture of attachments and devices for wearing apparel, notions, etc. The directors are Edwin G. Long, Anthony L. Malone and Albert Meavins.

The Laclede Mfg. Company, Buffalo, N. Y., is equipping its new Canadian branch lithographing and printing plant at Bridgeburg, Ont., with electrically operated machinery.

The Oxygen Fuel Company of Canada, Ltd., Toronto, has been incorporated with a capital stock of \$20,000 to manufacture heating apparatus. The incorporators include Gideon Grant, Bruce Williams and Andrew Dods.

Western Canada

WINNIPEG, MAN., September 12, 1912.

The managers of the different machinery houses are very well satisfied with the volume of business. It is by far the best season in the history of this country as far as they are concerned. The outlook is very promising for activity right up to the end of the year. Even supplying materials for new plants and improvements already announced would keep the local houses quite busy, and hardly a day passes in which some new propositions are not reported. Prospects are very favorable for the expansion of the flour milling and grain elevator trade in western Canada. Negotiations are either in progress or completed in Saskatchewan for two or three new mills.

The Northland Knitting Company, Winnipeg, has taken out a permit for the erection of a new factory, and machinery will be added to increase the capacity of the business.

The British Columbia Breweries Company, Ltd., Vancouver, B. C., will erect a plant at Prince Rupert. The company has several brewing plants at the coast.

The ratepayers of Medicine Hat, Alberta, have voted favorably on a by-law to raise \$300,000 for the installation of a new water system and filtration plant. This will be the first unit of a system capable of supplying 30,000,000 gal. per day.

The Perfection Fanning Mill Company is negotiating with the Town Council of Watrous, Sask., for a site and other inducements to establish there a factory for making fanning mills, grain tanks, water tanks, portable grain elevators, etc.

The Security Coal Mines Company, Ltd., Sir James Grant, Ottawa, president, has been incorporated under the laws of Alberta with a capital stock of \$1,500,000. The company has extensive coal areas at Wabumun, near Edmonton, Alberta, which it is proposed to develop without delay. George S. Armstrong, mayor of Edmonton, and Hon. George Harcourt, deputy minister of agriculture for Alberta, are interested in the concern.

The East Westminster Woodworking Company, Ltd., has secured a site in New Westminster, B. C., on which to erect a factory for making household and hotel fittings. The manager is W. Ramey.

C. E. Austin, formerly manager of the Robin Hood Flour Mill, at Moose Jaw, Sask., has joined A. C. Von Hagen, of Minneapolis, and others in organizing the Moose Jaw Flour Mills, Ltd., with an authorized capital stock of \$500,000. The company will at once proceed to erect buildings for a capacity of 3000 bbl. per day, and machinery for a capacity of 1500 bbl. will be installed as soon as the building is finished. Mr. Von Hagen will be president and Mr. Austin treasurer and general manager.

Leitch Bros. Flour Mills, Ltd., Oak Lake, Man., will install a new power house and machinery to double the present capacity of about 600 bbl. per day.

A by-law will be submitted to the ratepayers of Yorkton, Sask., on September 27, authorizing the expenditure of \$91,000 to extend the electric light system there and a smaller amount for waterworks extensions.

The town of Edson, Alberta, will spend \$200,000 on improvements, including \$63,000 on waterworks and electric light.

The town of Dauphin, Man., will spend \$29,000 on sewage disposal works. The secretary-treasurer is J. W. Johnston, and the engineers, Chipman & Power, Mail Building, Toronto.

T. P. Kelly is erecting a grain elevator at Fort William. The architect is R. E. Mason, of that city.

George Trudell, 390 Dundas street, London, Ont., is the representative of a syndicate that will establish a motorcycle factory at Port Arthur. Plans are in progress.

Plans are in progress for a grain elevator for the Redcliffe Milling Company, Ltd., Redcliffe, Alberta.

The Maple Leaf Milling Company, Ltd., Brandon, Man., is erecting a grain elevator there. The architect is George H. Archibald, 827 Union Bank Building, Winnipeg.

The owners of the Utica Mine, Kaslo, B. C., will install a small sawmill to cut timber and props for the workings, as well as lumber for the company buildings and flumes.

The Colonial Sash & Door Company, recently incorporated, is erecting a factory at Huntingdon, B. C. It will be operated with electric power.

The sash and door factory of Hatch Bros., Ltd., Vancouver, recently burned, will be rebuilt at once. The loss of about \$45,000 was practically covered by insurance.

Work on the new \$500,000 shipbuilding plant at Coquitlam, B. C., began some days ago. According to specifications, it will be the most comprehensive on the mainland, for, although ships of from 300 to 800 tons will be the principal output at the start, the officials expect to enlarge the plant after the opening of the Panama Canal. Eight and one-half acres have been secured. L. D. Schafner, of Bridgetown, N. S., and several Vancouver and Victoria capitalists are interested. There is already a sawmill belonging to the new company on the ground ready for use. Sailing ships with auxiliary power, specially designed for the lumber trade, will be built.

The Hanbury Mfg. Company will increase its capacity for the manufacture of office furniture and fixtures.

The Minneapolis Threshing Machine Company will erect a warehouse and office building at Regina, Sask.

The B. C. Sugar Refining Company, Vancouver, B. C., will erect a warehouse at Regina, Sask.

The contract has been awarded for the construction of the Nanton Starch Company's factory at Fort William, Ont.

Herbert Snell, Moose Jaw, Sask., is putting up a department store to cost \$150,000.

The Garment Traction Plow Company, Springfield, Ohio, proposes to establish a Canadian plant at Moose Jaw, Sask.

Government Purchases

WASHINGTON, D. C., September 16, 1912.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids September 28 for furnishing and installing complete one 120-hp. and one 225-hp. fuel oil engines with 94 and 175-kw. generator respectively; four centrifugal pumps, two being motor-driven fire pumps of 1000-gal. per minute capacity; two steam turbine-driven hot water pumps of 500 gal. per minute capacity; also to move three model and install one 160-kw. Busch-Selzer Bros. Diesel engine generator set now on hand at the Narragansett naval station, Narragansett Bay, R. I.

The Department of the Interior, office of Indian Affairs, Washington, will open bids October 10 for furnishing materials and labor for the installation of a central steam heating plant and an acetylene gas lighting plant at the Crow Creek Indian School, S. D.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids September 10 for materials and supplies for the navy yards as follows:

Schedule 4773, class 21, one continuous blue printing machine for delivery to Brooklyn—Bidder 66, Leet Brothers, Washington, D. C., \$850; 92, C. F. Pease Company, Chicago, Ill., \$700, \$750 and \$1,300; 98, Revolute Machine Company, New York, \$833.63 and \$886.90; 106, Fred A. Schmidt, Washington, \$932.70.

Class 22, one No. 3 Toledo pipe threading tool—Bidder 64, Knox & Brother, New York, \$410; 74, Manning, Maxwell & Moore, New York, \$210; 124, Universal Supply Company, New York, \$239; 144, Rawles-Cobb Company, Boston, Mass., \$338.57.

Schedule 4774, class 31, one type 3 Quick work rotary shear, complete—Bidder 40, Frevert Machinery Company, New York, \$924; 110, H. Collier Smith, Detroit, Mich., \$950; 124, Universal Supply Company, New York, \$950.

Schedule 4780, class 83, 14 ventilating sets and spare armatures—Bidder 33, Diehl Mfg. Company, Elizabethport, N. J., \$1,097; 114, B. F. Sturtevant Company, Hyde Park, Mass., \$1,130.50.

Trade associations throughout the country will be interested in a bulletin soon to be issued by the Bureau of Foreign and Domestic Commerce, Department of Commerce and Labor, entitled "Commercial Organizations," which gives the results of an investigation by E. A. Brand, formerly commercial agent and now assistant chief of the bureau, of the activities of 70 commercial associations in the United States, with special reference to the development of foreign trade. The territory covered in the investigation included cities in New England, New York, Pennsylvania and many in the Middle West.

Trade Publications

Corliss Engines.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1526. Calls attention to a side crank type of engine which is built in a variety of horizontal and vertical arrangements. The several features of the construction are briefly touched upon and the text is supplemented by illustrations of the different parts as well as views of installations.

Quick-Opening Valves.—Marsh Valve Company, Dunkirk, N. Y. Booklet. Points out the advantages of using the Marsh quick-opening double-seat valves which are made in all the standard patterns. All of these are illustrated with brief specification tables and prices.

Forged Motor Gears.—R. D. Nuttall Company, Pittsburgh, Pa. Catalogue No. 11. Covers a line of forged steel motor gears and pinions for street railway service which are made for all the active motors of the Westinghouse and General Electric companies. These gears can be furnished in the solid style only, but in medium, high and low carbon grades. If desired the medium and high carbon gears can be furnished oil treated as well and the low carbon gear is always case hardened. Lists of the different gear ratios which can be furnished for the various motors are included.

Electric Motors.—Electro-Dynamic Company, Bayonne, N. J. Three leaflets. Give the wiring diagrams of inter-pole direct-current motors with various types of controllers.

Oxy-Acetylene Welding and Cutting.—Davis-Bournonville Company, 96 West street, New York City. Two folders. No. 6 calls attention to the use of the oxy-acetylene process in locomotive repair work and especially with Davis-Bournonville apparatus. A feature of this folder is the reproduction of photographs of locomotive and boiler repairs recently made in the shops of one of the largest railroads with brief statements as to the work done and the cost of doing it. No. 7 is concerned with the style C torch which is claimed to be very light. The welding torch is made in three different sizes while the cutting torch is made in but one size with three different tips which can be readily interchanged.

Feed Water Strainers.—Lagonda Mfg. Company, Springfield, Ohio. Bulletin R-1. Points out why a strainer is necessary and how much power is lost in plants due to decreasing the vacuum by restricting the flow of condensed circulating water. The points of superiority of this strainer are taken up and there are a number of photographs showing how they may be buried under the floors of boiler rooms with only the handwheel projecting above the surface, which does not reduce the available floor space or interfere with the ready cleaning of the strainer. Illustrated descriptions of these strainers have appeared in *The Iron Age*, October 6, 1910, and December 14, 1911.

Lifting Magnet and Magnetic Separator.—Cutler-Hammer Clutch Company, Milwaukee, Wis. Two bulletins. The first describes a circular type of lifting magnet, and in its 48 pages there are many illustrations showing the magnet used for a great variety of purposes both indoors and out, under water and in snow storms. Considerable new data and figures are contained and a table giving the particular adaptations of the various sizes from 18-in. to the 62-in. magnet is included. Mention is also made of the record established by two 62-in. magnets which unloaded 4,000,000 lb. of pig iron in 10½ hr. An illustrated description of these magnets and an account of the establishing of this record appeared in *The Iron Age*, April 6, 1911. Bulletin No. 13,000 describes magnetic separators for use in cement and paper pulp mills, terra cotta plants or wherever it is desired to remove the magnetic contents from non-magnetic bulk material. An illustrated description of this separator appeared in *The Iron Age*, May 2, 1912.

Chain Grate Stokers.—Illinois Stoker Company, Alton, Ill. Pamphlet. Gives general description and specifications for the Illinois mechanical stoker which is designed to burn the smaller sizes of inferior quality coal. The special features of the stoker are briefly touched upon followed by a complete description of the stoker with numerous illustrations.

Oil Switches and Maximum Demand Indicator.—General Electric Company, Schenectady, N. Y. Two bulletins. No. A4001 describes the line of oil switches which are intended primarily for use in small isolated alternating-current plants, where the voltage is not greater than 3300. The bulletin contains connection and dimension diagrams and information for use in selecting the type of switch required. No. A4002 is devoted to the type W polyphase maximum demand indicator which is suitable for recording the maximum load of alternating current circuits irrespective of the power factor and voltage fluctuations.

Valves.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Folder. Illustrates and describes briefly several types of cushioned triple-acting and non-return valves, which are designed to protect boilers and steam lines in a power plant. Other valves shown include an automatic quick-closing stop valve, an automatic engine stop valve and several types for water main service. Illustrated descriptions of the triple-acting valve and the electrically-operated stop valve appeared in *The Iron Age*, February 17, 1910, and October 10, 1911, respectively.

